Hazardous Waste Regulation and Tax Policy Task Force

Glossary

Compiled by the Office of Legislative Research and General Counsel

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The definitions and information contained in this document came from multiple federal, state, and national sources. Federal sources included: the Department of Energy, the Environmental Protection Agency, the US Nuclear Regulatory Commission, the United States Code Service (Title 42), and the Code of Federal Regulations (Titles 10 and 40). State sources included: Titles 19 and 59 of the Utah State Code Annotated and the Utah Department of Environmental Quality. Additionally, we drew information from: the Institute for Energy and Environmental Research, RadWaste.org, and the Nuclear Waste Pimer: A Handbook for Citizens.

Because federal regulations set forth certain minimum classification standards, but leave other classification standards to be determined by each state, waste definitions can and do vary. In order to reflect some of this variance and provide a broad spectrum of waste definitions, we included duplicate definitions.

Radioactive Waste Glossary

11e.(2) waste. Uranium and./or thorium mill tailings which are regulated separately under the Uranium Mill Tailings Radiation Control Act (UMTRCA), 11e.(2) refers to a section of the Atomic Energy Act which defines wastes.

A

absorbed dose. The amount of energy deposited in a unit of biological tissue. The units of absorbed dose are the rad and gray.

activation production. A radioactive material produced by bombardment with neutrons, protons, or there nuclear particles.

activation products. Atomic fragments absorbed by the steel of the reactor vessel or by minerals in the water used for cooling that give off radiation for years.

active inventory. Containers of mixed waste which have not been treated, and/or shipped off-site for treatment and disposal.

activity. The rate at which radioactive material emits radiation, stated in terms of the number of nuclear disintegrations occurring in a unit of time; the common unit of radioactivity is the curie.

AEC: Atomic Energy Commission, 1947-1974. Broken up in 1974 into the Energy Research and development administration (ERDA) and the Nuclear Regulatory Commission (NRC). ERDA later became the Department of Energy (DOE).

agreement State. States may enter into agreements with the Nuclear Regulatory Commission to obtain primacy for a program. Utah is an Agreement State for radioactive materials and low-level waste but not uranium mills and tailings.

agreement state. A states that has entered into an agreement with the U.S. Nuclear Regulatory Commission (as specified by the Atomic Energy Act of 1954) and has authority to regulate the disposal of low-level radioactive waste under such an agreement. This term is used in the Low-Level Radioactive Waste Policy Act (Public Law 99-240).

agreement state. A state that has entered into an agreement with the Nuclear Regulator Commission to assume regulatory responsibility for radioactive materials under Section 274 of the Atomic Energy Act of 1954 as amended.

air stripping. A technology that involves the mass transfer of volatile contaminants from water to air. Typically conducted in a packed tower or aeration tank, a spray nozzle distributes contaminated water over packing in a column; a fan forces air against the water flow; and a sump at the bottom of the tower collects the decontaminated water.

alpha decay. Radioactive decay in which an alpha particle (4He nucleus) is emitted.

alpha particle. A positively charged particle emitted during decay of certain radioactive elements. Alpha particles are the least penetrating of the three common forms of ionizing radiation (alpha, beta, gamma). They can be stopped by a sheet of paper or the skin but are harmful if inhaled or ingested. An alpha particle is indistinguishable from a helium nucleus and consists of two protons and two electrons.

alpha particle. Positively charged particle emitted by certain radioactive material, made up of two neutrons and two protons. It cannot penetrate clothing or the outer layer of skin.

atom. The basic component of all matter; it is the smallest part of an element having all the chemical properties of that element. Atoms are made up of protons and neutrons (in the nucleus) and electrons.

Atomic Energy Act. Legislation passed in 1954 to place production and control of nuclear material within a civilian agency, originally the Atomic Energy Commission.

Atomic Energy Commission. Created by Congress in 1946 as the civilian agency responsible for producing nuclear weapons, it also researched and regulated atomic energy. In 1975 its weapons production and research activities were given to the Energy Research and Development Administration, while its regulatory responsibilities were handed over to

the newly formed Nuclear Regulatory Commission. The Energy Research and Development Administration became the Department of Energy in 1977.

atomic mass. The number of protons and neutrons in an atom. For instance, uranium-238 has an atomic mass of 238–92 protons and 146 neutrons.

B

backfill. The material used to fill in around casks after they have been placed in a repository or shallow land burial trench.

backfilling. Another layer of protection to prevent radioactive material from entering the environment.

background radiation. Radiation arising from natural radioactive materials always present in the environment, including solar and cosmic radiation and radioactive elements in the upper atmosphere, the ground, building materials, and the human body.

barrier means any material or structure that prevents or substantially delays movement of water or radionuclides toward the accessible environment. For example, a barrier may be a geologic structure, a canister, a waste form with physical and chemical characteristics that significantly decrease the mobility of radionuclides, or a material placed over and around waste, provided that the material or structure substantially delays movement of water or radionuclides.

basalt. An igneous rock of volcanic origin, usually fine-grained and black or dark gray.

bedded. Layered deposit of sediment in the form of rocks, products of weathering, organic materials, and precipitates.

beta decay. Radioactive decay in which a beta particle (negative or positive electron) is emitted.

beta particle. A negatively charged particle emitted in the radioactive decay of certain nuclides. A beta particle has mass and charge equal to that of an electron and has a short range in air and low ability to penetrate other materials.

bioremediation. The process of using microorganisms to degrade or break down hazardous material.

boiling water reactor. A power-generating nuclear reactor in which the reactor cooling water is used to drive the electrical generator (turbine). See also pressurized water reactor.

boiling water reactor. A light-water-cooled reactor in which the water coolant that passes through the reactor is converted to high-pressure stream that flows through the turbine.

branching ratio. In branching radioactive decay, the fraction of nuclei that disintegrates in a specific way. (It is usually expressed as a percentage).

breeder reactor. A reactor that produces more fissile material than it consumes (by a process called "breeding").

buffer zone. A controlled clean area around a contaminated area for staging workers and preventing the spread of contamination during work.

burial grounds. An area for near-surface disposal in soil or shallow rock used for low-level radioactive, chemical, hazardous, or other waste; and obsolete or contaminated equipment.

burn-up: The amount of energy that has been generated from a unit of nuclear fuel; usually measured in megawatt-days per metric ton of initial heavy metal.

by-product Material There are basically two types of by-product materials. The first are produced by a nuclear reactor and the second are produced by the uranium and thorium mining process. A more precise definition reads: "(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure incident to the process of producing or utilizing special nuclear material, and (2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed

primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "by-product material" within this definition (10 CFR 20.1003)."

by-product. Radioactive material from producing or processing nuclear materials. Some by-products have beneficial commercial uses.

C

calcining. A process that uses heat and calcium salts (crushed limestone) to reduce liquid, acidic high-level wastes to dry, powdered, non-acidic waste.

canister. A container used to hold vitrified high-level waste or spent fuel rods; a canister is usually made of welded stainless steel or an inert alloy.

canister. The outermost container into which glassified high-level waste or spend fuel rods are to be placed. Made of stainless steel or an inert alloy.

canyon. A vernacular term for a chemical separations plant inspired by the plant's long, high, narrow structure. Not all chemical separations plants are canyons.

capping. A containment action that involves covering a burial ground with protective material such as concrete, asphalt, impermeable soil (clay), and/or crushed rock.

capsules. Encapsulated strontium and cesium high-level wastes produced from defense reactor fuel reprocessing at the Hanford Site. For purpose of this report, inventories of encapsulated strontium and cesium are included in a separate table in the high-level waste section.

cask. A special container for shipping radioactive waste that is protective of human health and the environment.

cask. Container that provides shielding during transportation of canisters of radioactive materials. Usually measures 12 feet in diameter by 22 feet long and weighs 200 tons.

category one special nuclear material. A classification created in the Atomic Energy Act of 1954. As defined in Section 11, "category one" is "plutonium, uranium enriched in the isotopes 233 or 235, and any other material which the Nuclear Regulatory Commission determines to be special nuclear material . . ."

category two special nuclear material. A classification created in the Atomic Energy Act of 1954. As defined in Section 11, "category two" is "any material artificially enriched by any of the aforementioned materials" that is, plutonium, uranium-233 and -235, and any other material specified by the Nuclear Regulatory Commission.

cesspools. Underground tanks for raw sewage collection used where there is no sewage system.

chain reaction (controlled). A self-sustaining series of nuclear fissions taking place in a reactor core. Neutrons produced in one fission cause the next fission.

civilian radioactive waste. Low-level and high-level (including spent fuel) radioactive waste generated by commercial nuclear power plants, commercial facilities reprocessing spent nuclear fuel, manufacturing industries, and institutions (hospitals, universities, research institutions).

cladding. A corrosion-resistant tube (commonly aluminum, zirconium alloy, or stainless steel) surrounding the reactor fuel pellets which provides protection from a chemically reactive environment and containment of fission products.

cladding. Protective allow shielding in which fissionable fuel is inserted. Cladding is relatively resistant to radiation and to the physical and chemical conditions in a reactor core. The cladding may be of stainless steel or some alloy such as zircalloy.

Class A On average the least radioactive of the four LLW classes. Primarily contaminated with "short-lived" radionuclides. (average concentration: 0.1 curies/cubic foot)

Class B May be contaminated with a greater amount of "short-lived" radionuclides than Class A. (average concentration: 2 curies/cubic

foot)

Class C May be contaminated with greater amounts of long-lived and short-lived radionuclides than Class A or B. (average concentration: 7 curies/cubic foot)

closure reports. Documentation in support of the plan prepared to guide the deactivation, stabilization, and surveillance of a waste management unit or facility under RCRA.

commercial wastes. Low-level and high-level (including spent fuel) radioactive wastes generated by commercial nuclear power plants, manufacturing industries, and institutions (hospitals, universities, research institutions).

compact(s). States that have banded together under the Low Level Radioactive Waste Policy Act in an attempt to site a low-level radioactive waste facility. Utah is a member of the Northwest Compact, the state of Washington is the host state for the Compact and has a facility located near Richland, Washington

compaction. Reduction in bulk volume of solid waste by rolling and tamping. Also, reduction in bulk volume or thickness of a body of fine-grained sediments in response to increasing weight of overlaying material.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). A Federal law enacted in 1980 that governs the cleanup of hazardous, toxic, and radioactive substances. The act and its amendments created a trust fund, commonly known as Superfund, to finance the investigation and cleanup of abandoned and uncontrolled hazardous waste sites. Under this act the Department conducts remedial investigations and feasibility studies to determine the sources and extent of contamination and ultimately the cleanup alternatives.

consumed inventory. Containers of mixed waste which have undergone treatment (e.g., immobilization, stabilization) within the Preferred Option.

contaminant migration. Movement of contaminants from the original hazardous release site, usually via air or ground water. Contamination is also spread by birds and animals.

contamination. The presence of unwanted hazardous or radioactive matter at levels that present potential safety and health risks to the public, site workers, or facility occupants; or render some portion of the environment unsuitable for use.

contingency management. An Environmental Protection Agency approach to handling wastes where wastes that would be considered hazardous if not controlled are considered non-hazardous under controlled management.

conversion, fuel. Chemical treatment of yellowcake (U3O8) to uranium hexafluoide (UF6) in preparation for enrichment.

corrective action decision. A determination that corrective action is necessary and required.

corrective action. Those actions taken to control, remediate, or prevent releases from hazardous waste management units, solid waste management units, or other sources at treatment, storage, or disposal facilities.

curie. Unit of radioactivity equal to the radioactivity of 1 gram of radium -226. It is equal to 37 billion disintegrations per second.

curie (Ci) means the amount of radioactive material that produces 37 billion nuclear transformation per second. One picocurie (pCi) = 10[sup] -12Ci.

curie (Ci) means that quantity of radioactive material producing 37 billion nuclear transformations per second. (One millicurie (mCi)=0.001 Ci.)

curie. A measure of the rate of radioactive decay, it is equivalent to the radioactivity of one gram of radium or 37 billion disintegrations per second. A nanocurie is one billionth of a curie; a picocurie is one trillionth of a curie.

D

daughter product. Nuclides resulting from the radioactive decay of other nuclides. A daughter product may be either stable or radioactive.

deactivation. The process of placing a formerly active processing facility in a safe and stable condition until it can be decommissioned or dismantled. Facilities may not require full decontamination if surveillance and control of contamination is maintained.

decay chain, radioactive. A series of nuclides in which each member decays to the next member of the chain through radioactive decay until a stable nuclide has been formed.

decay correction: The amount by which the calculated radioactivity (for example, of a release of radioisotopes) must be reduced after a period of time, to allow for its radioactive decay during that time.

decay, radioactive. The transition of a nucleus from one energy state to a lower one, usually involving the emission of a photon, electron, neutron, or alpha particle.

decay. Disintegration of the nucleus of an unstable nuclide by spontaneous emission of charged particles, photons, or both.

decommissioning waste. Waste (generally low-level) collected or resulting from facility decommissioning activities.

decommissioning framework. The series of action steps to be followed in completing the decommissioning of a contaminated DOE surplus facility as described in the U.S. Department of Energy, Environmental Restoration Program, Implementation Guide, May 22, 1995 found in Appendix A of this Manual. The same framework applies whether the decommissioning is being performed as a removal action under CERCLA or as an environmental restoration action outside the CERCLA arena.

decommissioning plan. The document that constitutes Title II design for a decommissioning project which specifies the work to be done.

decommissioning. Activity that takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement. These actions are taken to retire a facility from service while protecting workers, the public, and the environment.

decommissioning. Decontamination and dismantlement of retired, contaminated facilities and removal and/or disposal of the resulting wastes.

decontamination. The removal or reduction of radioactive or hazardous contamination from facilities, equipment, or soil by washing, heating, chemical or electrochemical action, mechanical cleaning, or other techniques to achieve a stated objective or end condition.

decontamination. The removal of radioactive material from the surface or from within another material.

defense waste. Radioactive waste resulting from weapons research and development, the operation of naval reactors, the production of weapons material, the reprocessing of defense spent fuel, and the decommissioning of nuclear-powered ships and submarines.

Department of Energy. The cabinet-level U.S. Government agency responsible for nuclear weapons production, cleanup, and energy research of hazardous and radioactive waste at its sites. It was created from the Energy Research and Development Administration and other Federal Government functions in 1977.

depleted uranium: A by-product of uranium enrichment, the most common chemical form of which is depleted uranium hexafluoride (DUF_6). Natural uranium is composed of three isotopes: uranium-238 (99.284 percent); uranium-235 (0.711 percent); and uranium-234 (0.005 percent), all of which are radioactive. The purpose of uranium enrichment is to concentrate uranium-235, the fissile isotope, in one stream. The other stream which is low in uranium-235, is called "depleted uranium," which contains about 0.2 to 0.3 percent uranium-235.

DEQ. Utah Department of Environmental Quality

dismantlement. The disassembly or demolition and removal of any structure, system, or component during decommissioning and the satisfactory interim or long-term disposal of the residue from all or portions of the facility.

disposal system means any combination of engineered and natural barriers that isolate

spent nuclear fuel or radioactive waste after disposal.

disposal means permanent isolation of spent nuclear fuel or radioactive waste from the accessible environment with no intent of recovery, whether or not such isolation permits the recovery of such fuel or waste. For example, disposal of waste in a mined geologic repository occurs when all of the shafts to the repository are backfilled and sealed.

disposal. Emplacement of waste in a manner that ensures isolation from the biosphere for the foreseeable future, signifies no intent to retrieve it, and requires deliberate action to access it.

disposal. Permanent removal from man's environment with no provisions for continuous human control and maintenance.

disposition. Reuse, recycling, sale, transfer, storage, or disposal of materials.

dome. A bed that arches up to form a rounded peak deposit, e.g., a salt dome.

dose equivalent means the product of absorbed dose and appropriate factors to account for differences in biological effectiveness due to the quality of radiation and its spatial distribution in the body. The unit of dose equivalent is the "rem." (One millirem (mrem)= 0.001 rem.)

dose. A quantity of radiation or energy absorbed; measured in rads.

dose limit: Regulatory limit set on the amount of radiation that an individual may receive from artificial sources (excluding medical sources). Worker limits are set higher than general population limits.

dose reconstruction: Estimating exposure by considering emissions, environmental measurements, and routes of exposure.

dosimetry. Monitoring equipment used to assess exposure to radiation.

double-shell tanks. Large, reinforced-concrete, underground containers with two steel inner liners to contain liquid wastes. The space between the liners has instruments to detect leaks from the inner liner. New high-level waste tanks are double-shell tanks. See also single-shell tanks.

DRC. Division of Radiation Control, Utah Department of Environmental Quality

drum venting system. A modification to storage drums to vent gases that build up over time due to chemical reactions. Systems usually include a high efficiency particulate air filter to prevent release of radioactive particles.

dry cask storage. Heavily shielded, air-cooled storage casks for storing spent nuclear fuel.

DWPF: Defense Waste Processing Facility, the name of the vitrification plant for high-level radioactive wastes at the Savannah River Site.

dynamic underground stripping. A process that uses vacuum extraction, electric soil heating, and steam to remove volatile and semi-volatile compounds from soils.

E

EC. Envirocare of Utah, Inc.

effective dose equivalent (EDE): An equivalent dose to the whole body, calculated by multiplying the dose to a particular organ (or collection of organs) by a factor that allows a rough representation of equivalent whole body dose and hence the risk of radiogenic cancer.

external radiation dose: The dose from sources of radiation outside the body. This is most often from gamma rays, though beta rays can contribute to dose in the skin and other relatively superficial tissues.

effective dose means the sum over specified tissues of the products of the dose equivalent received following an exposure of, or an intake of radionuclides into, specified tissues of the body, multiplied by appropriate weighting factors. This allows the various tissue-specific health risks to be summed into an overall health risk. The method used to calculate effective dose is described in Appendix B of this part.

effluent. Any material that leaves a system.

electrokinetics. A new, developing technology that uses a direct current of electricity to move ionic materials through soil or ground water

between electrodes. Once the ions are forced to the appropriate electrode, they are collected and removed from the contaminated plume.

electron capture. Radioactive decay in which an orbital electron is captured by the nucleus of the radionuclide.

electrorefining. Purifying metals by electrolysis using an impure metal as the anode. The pure metal is dissolved from the anode and subsequently deposited at the cathode. Also, a petroleum refining process for light hydrocarbon streams in which an electrostatic field is used to help separate chemical treating agents such as acid or caustic from the hydrocarbon phase.

emplacement. Ore deposition, localization of ore minerals.

encapsulation. A process whereby waste is placed and sealed in casks, cones, or other containers to prevent material from moving through the environment.

enrichment, fuel. A nuclear fuel cycle process which increases the concentration of fissionable uranium (i.e., 235U) in uranium ore above its natural level of 0.71%. (The method currently used in the United States is gaseous diffusion.)

entombment. Encasement of radioactive contaminants in a structurally long-lived material such as concrete. Surveillance and maintenance of the entombment structure are continued until the radioactivity in the contaminants decays to a level where the property can be released without radiological restrictions. This alternative may be feasible for nuclear facilities contaminated with relatively short-lived radionuclides (i.e., contaminants which decay to permissible levels within about 100 years).

Environmental Protection Agency. A Federal agency responsible for enforcing environmental laws, including the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act; and the Toxic Substances Control Act. It was established in 1970.

equilibrium cycle. An assumed nuclear fuel cycle in which the feed and waste materials of a facility have constant compositions. In a reactor this condition typically results after the third or fourth fuel-loading schedule.

evaporation pond. A pond where water is held to evaporate, leaving residue behind. In the past, some low-level radioactive liquid wastes were put in evaporation ponds, leaving areas that are now contaminated. See also solar pond.

evaporator. A devise used to vaporize part or all of the solvent from a solution. The product is usually either a solid or a concentrated solution of the solute.

Exposure. A measure of ionization produced in air by X rays or by GAMMA RADIATION. Acute exposure generally refers to a high level of exposure of short duration; chronic exposure is lower-level exposure of long duration.

external radiation dose: The dose from sources of radiation located outside the body. This is most often from gamma rays, though beta rays can contribute to dose in the skin and other relatively superficial tissues.

F

fabrication, fuel. Conversion of enriched uranium hexafluoride (UF6) into pellets of ceramic uranium dioxide (UO2). These pellets are then sealed into corrosion-resistant tubes of zirconium alloy or stainless steel. The loaded tubes, called fuel elements or rods, are then mounted into special assemblies for loading into the reactor core.

Federal Facility Compliance Act. The Federal act that requires the Department of Energy to develop and submit to States or the Environmental Protection Agency plans for developing mixed-waste treatment capacity and technologies.

fissile material: A material consisting of atoms whose nuclei can be split when irradiated with low energy (ideally, zero energy) neutrons. Well-known examples are plutonium-239 and uranium-235.

fissile. Able to be split by a low-energy neutron, for example, U-235.

fission products. A general term for the complex mixture of nuclides produced as a result of

nuclear fission. Most, but not all, nuclides in the mixture are radioactive and they decay, forming additional (daughter) products, with the result that the complex mixture of fission products so formed contains about 200 different isotopes of over 35 elements.

fission. The splitting or breaking apart of a heavy atom such as uranium. When a uranium atom is split, large amounts of energy and one or more neutrons are released.

Formerly Utilized Sites Remedial Action Program (FUSRAP). This Federal program was initiated in 1974 to identify and remediate sites around the country that were contaminated during the 1940s and 1950s as a result of research and development, processing, and production of uranium and thorium, and storage of processing residues.

fuel cycle, nuclear. The complete series of steps involved in supplying fuel for nuclear reactors. It includes mining, refining, UF6 conversion, enrichment, fabrication of fuel elements, use in a reactor, and management of radioactive waste. It may also involve chemical processing to recover the fissionable material remaining in the spent nuclear fuel, reenrichment of the fuel material, and/or refabrication of new fuel elements.

fuel assembly. A grouping of nuclear fuel rods that remains integral during the charging and discharging of a reactor core.

fuel cycle. The complete series of steps involved in supplying fuel for nuclear reactors. It includes mining, refining, the original fabrication of fuel elements, their use in a reactor, and management of spend fuel and radioactive wastes. A closed fuel cycle includes chemical reprocessing to recover the fissionable material remaining in the spent fuel; an open fuel cycle does not.

G

gamma radiation. Short-wavelength electromagnetic radiation emitted in the radioactive decay of certain nuclides. Gamma rays are highly penetrating.

gaseous diffusion. The process used to make enriched uranium in the United States.

generation (waste). The origination of new waste from various facility operations (including production, rework, decontamination and decommissioning, and environmental restoration), including the recovery of pre-1970 transuranic-produced wastes, should their recovery be determined necessary.

generator. A producer of hazardous waste under the Resource Conservation and Recovery Act.

geologic isolation. The disposal of radioactive wastes deep beneath the earth's surface.

geologic repository. An underground dwelling to dispose of high-level radioactive waste. The location being explored is at the Nevada Test Site. See also mined geologic disposal system.

glass frit. A fusible ceramic mixture used to make glass for use in the immobilization and disposal of high-level wastes.

glove box. Filtered and ventilated enclosures that allow workers to handle hazardous materials without having direct contact with the contents.

gray: A unit of absorbed radiation dose equal to 100 rads.

greater-than-class-c low-level waste. Waste from commercial sources containing concentrations of radionuclides that exceed U.S. Nuclear Regulatory Commission limits for Class C low-level radioactive waste, as defined in 10 CFR Part 61.55.

grout. A mortar or cement mixture used to immobilize radioactive waste.

GTCC Most radioactive of the low-level classes. (average concentration: 300 to 2,500 curies/cubic foot) (The 300 figure is based on the 1985 inventory. The higher figure represents anticipated inventory in 2020, including some decommissioning wastes.)

H

half-life: The time in which half the atoms of a radioactive substance will have disintegrated, leaving half the original amount. Half of the residue will disintegrate in another equal period of time.

half-life. The time required for a radioactive substance to lose 50 percent of its activity by decay.

half-life. Time required for a radioactive substance to lose 50 percent of its activity by decay. The half-life of the radioisotope plutonium-239, for example, is about 24,000 years. Starting with a pound of plutonium-239, in 24,000 years there will be ½ pound of plutonium-239, in another 24,000 years there will be 1/4 pound and so on. (A pound of actual material remains but it generally become a stable element.)

half-live, radioactive. For a single radioactive decay process, the time required for the activity to decrease to one-half of its initial value by the process.

hazardous waste. Waste that is regulated under RCRA Subtitle C. A solid waste or combination of solid wastes that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

hazardous substance. The term "hazardous substance" means (A) any substance designated pursuant to section 311(b)(2)(A) of the Federal Water Pollution Control Act (FWPCA); (B) any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA; ©) any hazardous waste having the characteristics identified under or listed pursuant to section 2001 of the Solid Waste Disposal Ac6t (SWDA) (but not including any waste the regulation of which, under the SWDA, has been suspended by Act of Congress); (D) any toxic pollutant listed under the 307(a) of the FWPCA; (E) any hazardous air pollutant listed under section 112 of the Clean Air Act; and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to section 7 of the Toxic Substances Control Act. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under sub-paragraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

Hazardous Waste Operations and Emergency Response (HAZWOPER). Regulations established by the Occupational Safety and Health Administration to govern the health and safety of employees engaged in hazardous waste operations and emergency response. The regulations are found in 29 CFR Part 1910.120.

Hazardous Waste Identification Rule. A rule, currently being developed by the Environmental Protection Agency, that proposes exit levels for process waste that is a listed hazardous waste, or has been mixed with, derived from, or contains listed hazardous wastes.

hazardous waste A subset of solid wastes that pose substantial or potential threats to public health or the environment and meet any of the following criteria identified 40 CFR 260 and 261: is specifically listed as a hazardous waste by EPA exhibits one or more of the characteristics of hazardous waste (ignitability, corrosivity, reactivity, and/or toxicity); is generated by the treatment of hazardous waste; or is contained in a hazardous waste.

Health and Safety Plan (HASP). A site plan, required by the HAZWOPER regulations and prepared and followed by any employer whose workers engage in hazardous waste operations, which addresses the safety and health hazards of each phase of site operation and includes the requirements and procedures for employee protection. Guidelines for a HASP can be found in the DOE limited standard DOE-EM-STD-5503-94.

heavy water. Water that contains deuterium in the place of hydrogen atoms. Used in Savannah River Site production reactors.

heavy metal means all uranium, plutonium, or thorium placed into a nuclear reactor.

heavy metal (RCRA metals) A common

hazardous waste; can damage organisms at low concentrations and tends to accumulate in the food chain. Examples are Lead, Chromium, Cadmium, and Mercury.

HEU: Highly enriched uranium.

high-level waste. The highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste and any derivative solid waste, that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.

high-level waste (HLW). Highly radioactive material, containing fission products, traces of uranium and plutonium, and other transuranic elements, that results from chemical reprocessing of spent fuel. Originally produced in liquid form, HLW must be solidified before disposal.

high-level radioactive waste, as used in this part, means high-level radioactive waste as defined in the Nuclear Waste Policy Act of 1982 (Pub. L. 97-425).

high-level waste according to the NRC After uranium fuel has been used in a reactor for a while, it is no longer as efficient in splitting its atoms and producing heat to make electricity. It is then called "spent" nuclear fuel. About one-fourth to one-third of the total fuel load is spent and is removed from the reactor every 12 to 18 months and replaced with fresh fuel. **The spent nuclear fuel is high-level radioactive waste**

high-level radioactive waste means (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.

high-level waste (HLW) 1) Spent Fuel: irradiated commercial reactor fuel 2) Reprocessing Waste: liquid waste from solvent extraction cycles in reprocessing. Also the solids into which liquid wastes may have been converted. NOTE: The Department of Energy defines HLW as reprocessing waste only, while the Nuclear Regulatory Commission defines HLW as spent fuel **and** reprocessing waste.

high-level waste. Spent fuel rods from nuclear power plants, regulated by the Federal government.

hold-up materials. Materials which remain in building components to be decommissioned in Safe Shutdown. A portion of these materials is estimated to be mixed waste.

hot lab. A laboratory designed for research with highly radioactive materials for which special handling precautions are required.

hot spot. Localized source of radiation or radioactive material. The radiation levels of hot spots exceed the general area radiation level by more than a factor of five and are greater than 100 millirem/hour on contact.

hot cell. A heavily shielded compartment in which highly radioactive material can be handled, generally by remote control.

hydrofracture. A process formerly used for permanent disposal of low-level (approximately 0.25 Ci/L) liquid waste at the Oak Ridge National Laboratory. The process involved mixing the waste with a blend of cement and other additives with the resulting grout being injected into shale at a depth of 200 to 300 m. The injected grout hardened into thin, horizontal sheets several hundred meters wide.

I

Igneous. Formed by solidification of molten rock.

immobilization. Treatment of soil or waste media to reduce migration of hazardous or radioactive contaminants.

in situ microbial filter. A filter consisting of a permeable wall of microorganisms that attack and degrade certain contaminants. The filter is placed below the earth's surface in contaminant plumes.

incineration. A treatment technology that uses combustion to destroy organic contaminants

and reduce waste volumes. Waste is converted into a safe, nonburnable ash that can be disposed of safely on land or underground.

industrial waste. Commercial low-level waste resulting from nonnuclear fuel cycle sources. These include the commercial producers of radiochemicals and radiopharmaceuticals, luminous dial manufacturers, and instruments that incorporate sealed source components (e.g., smoke detectors).

institutional waste. Commercial low-level waste resulting from bioresearch, medical, and certain nonbioresearch sources. Bioresearch waste include waste from animal studies at universities. Medical wastes include those generated from diagnostic and therapeutic procedures on humans at hospitals. Nonbioresearch waste include research reactor waste; small-volume, sealed radiation sources; and accelerator targets.

interim storage. The temporary holding of wastes on or away from the generator's site when disposal space is not available. Monitoring and human control are provided, and subsequent action involving treatment, transportation, or final disposition is expected.

internal radiation dose: The dose to organs of the body from radioactive materials inside the body. It may consist of any combination of alpha, beta, and gamma radiation.

internal radiation dose: The dose to the organs of the body from radioactive material that has entered the body through inhalation, ingestion, or through cuts and wounds. It may consist of any combination of alpha, beta, and gamma radiation caused by incorporated radioactive material. Internal dose also includes indirect ionization cause by neutrons traversing the body.

International Atomic Energy Agency. An 113-member independent organization under the aegis of the United Nations. The Agency's programs concentrate on radioactive waste safety standards, safeguards for spent nuclear fuel storage and handling, and transportation regulations for hazardous waste.

ion exchange. A chemical process involving the reversible interchange of various ions between a solution and a solid material. It is used to separate and purify chemicals, such as fission products or rare earths in solution. This process also takes place with many minerals found in nature and with ions in solution such as groundwater.

ion. Atomic particle, atom, or chemical radical bearing an electric charge, either negative or positive.

ionization. Removal of electrons from an atom, for example, by means of radiation, so that the atom becomes charged.

ionizing radiation. Types of radiation capable of removing one or more electrons from atoms they encounter, leaving positively charged particles such as alpha and beta, and nonparticulate forms such as X rays and gamma radiation. High enough doses of ionizing radiation may cause cellular damage. Nonionzing radiation includes visible, ultraviolet, and infrared light as well as radio waves.

irradiation. Exposure to radiation of wavelengths shorter than those of visible light (gamma, x-ray, or ultraviolet). Used for medical purposes to destroy bacteria in milk or other foods and sterilize medical instruments and bandages or to induce the polymerization of monomers or vulcanization of rubber.

isolation barriers. Natural or engineered barriers designed to separate nuclear waste from workers, the public, or the environment.

isotopes. Different forms of the same chemical element, which are distinguished by having different numbers of neutrons (but the same number of protons) in the nucleus of their atoms. A single element may have many isotopes. For example, uranium appears in nature in three forms: uranium-234 (142 neutrons), uranium-235 (143 neutrons), and uranium-238 (148 neutrons); each uranium isotope has 92 protons.

L

LASAGNA technology. A soil remediation process that uses electrical fields to move water and contaminants through layered zones for treatment.

latent period. The period or state of seeming inactivity between the time of exposure of tissue to an acute radiation dose and the onset of the final stage of radiation sickness.

leaching. The removal of compounds via percolation of liquids.

legacy waste. Any waste within a complex that was generated by past weapons production or research activities and is in storage awaiting treatment or disposal.

LEU: Low enriched uranium.

light-water reactor (LWR). A nuclear reactor cooled and moderated by water.

lignite ash. Ash produced from burning lignite coal, a brownish-black coal that is between peat and subbituminous coal in coalification.

linear energy transfer (LET): Refers to the rate of energy transfer (and thus damage) per unit at distance travelled. For example, alpha is high-LET radiation, while photons and electrons are low-LET radiation.

linear hypothesis. The assumption that any radiation causes biological damage, according to a straight-line graph of health effect versus dose.

liquid metal nuclear fuel. A nuclear fuel consisting of a solution of uranium or plutonium in a molten metal such as bismuth.

Liquid Scintillation Cocktail (LSC) A common fluid used in medical laboratories to analyze DNA and proteins. It often uses radioactive tracers and RCRA listed hazardous materials such as Toluene and Xylene. The combination of the two make it a mixed waste. By volume it is the most common form of commercially generated (non-DOE) mixed waste (71% in a 1990 national study).

LLRW. Low-Level Radioactive Waste, class-ified into A, B, and C categories.

long-term storage. Retention and monitoring of waste for an extended period of time pending treatment and/or final disposal. Work in long-term storage is retrievable.

low temperature thermal desorption. The process of using heat to separate volatile metals (e.g., arsenic and mercury) from soil. Soil is excavated and loaded into a thermal desorption machine. The soil is then heated to temperatures ranging from 200 to 600 degrees, mixed, and tossed. Moisture and chemicals separate from the soil which is then treated again. Clean gases are released to the atmosphere; the treated soil can be used as backfill. Also called low temperature thermal stripping.

low-level waste. Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, spent nuclear fuel, or by-product material.

low-level radioactive waste: A catch-all category of waste defined by U.S. law as all wastes that are not in other categories such as "high-level" waste and mill tailings; radioactivity of "low-level" wastes varies widely and includes both short- and long-lived isotopes.

low-level waste according to NRC Low-level radioactive waste includes items that have become contaminated with radioactive material or have become radioactive through exposure to neutron radiation. This waste is typically contaminated protective shoe covers and clothing, wiping rags, mops, filters, reactor water treatment residues, equipment and tools, luminous dials, medical tubes, swabs, injection needles, syringes, and laboratory animal carcasses and tissues. The most intensely radioactive wastes are typically found in the water treatment residues, discarded parts from nuclear reactors and small gauges containing radioactive material. Graph - Volume of Low-Level Waste Received at U.S. Disposal Facilities. The NRC has adopted a waste classification system for low-level radioactive waste based on its potential hazards, and has specified disposal and waste form requirements for each of the general classes of waste: Class A, Class B and Class C waste. Although the classification of waste can be complex, Class A waste generally contains lower concentrations of long half-lived radioactive material than Class B and C wastes.

low-level waste (LLW). Radioactive waste not

classified as high-level waste, transuranic waste, spent fuel, or byproduct material. Most are generally short-lived and have low radioactivity.

low-level radioactive waste means radioactive material that (A) is not high-level radioactive waste, spent nuclear fuel, transuranic waste, or by-product material as defined in section 11e(2) of the Atomic Energy Act of 1954 (42 U.S.C. 2014(e)(2)); and (B) the Commission, consistent with existing law, classifies as low-level radioactive waste.

low-level mixed waste (LLMW) LLMW is waste that contains LLRW and hazardous waste.

low-level waste (LLW) Defined by what it is not. It is radioactive waste not classified as high-level, spent fuel, transuranic or byproduct material such as uranium mill tailings. LLW has four subcategories: Classes A, B, C, and Greater-Than Class-C (GTCC), described below. On average, Class A is the least hazardous while GTCC is the most hazardous.

Low-level radioactive waste (LLRW or LLW) LLRW is waste that satisfies the definition of LLRW in the Low-Level Radioactive Waste Policy Amendments Act of 1985. The LLRWPAA defines LLRW as "radioactive material that (A) is not high-level radioactive waste, spent nuclear fuel, or byproduct material as defined in section 11e.2 of the Atomic Energy Act of 1954) and; (B) the Nuclear Regulatory Commission, consistent with existing law and in accordance with paragraph (A), classifies as low-level radioactive waste." In a sense, LLRW is defined by what it is not and consequently is the most broad category of waste. It encompasses materials that are slightly above natural radiation background levels to highly radioactive materials which require extreme caution when handling (Greater than Class C - GTCC).

M

management means any activity, operation, or process (except for transportation) conducted to prepare spent nuclear fuel or radioactive waste for storage or disposal, or the activities associated with placing such fuel or waste in a disposal system.

map. Locations of Uranium Mill Tailings Sites.

microwave solidification. A mixed waste treatment process being developed at the Rocky Flats site. The technology, which is applicable to homogeneous wet or dry inorganic solids, dries waste, mixes it with a slice source and matrix modifier, transfers it to a processing container, and melts the mixture with microwave energy.

mill tailings: A slurry of about 40 percent solids (including radioactive particles

mill tailings consist of fine-grained, sand-like and silty materials, usually deposited in large piles next to the mill that processed the ore. Uranium mills are located principally in the western United States, where deposits of uranium ore are more plentiful. NRC requires licensees to meet Environmental Protection Agency standards for cleanup of uranium and thorium mill sites after the milling operations have permanently closed. This includes requirements for long-term stability of the mill tailings piles, radon emissions control, water quality protection and cleanup, and cleanup of lands and buildings. NRC regulations require that a cover be placed over the mill tailings to control the release of radon gases at the end of milling operations. The cover must be effective in controlling radon releases for 1,000 years to the extent reasonably achievable and, in any case, for no less than 200 years. The uranium mill tailings contain chemical and radiological material discarded from the mill. Radium and thorium, which are the dominant radioactive materials in mill tailings, have long half-lives (1,600 and 77,000 years respectively). Therefore Congress requires perpetual government custody of the tailings disposal sites.

mill tailings according to NRC Tailing wastes are generated during the milling of certain ores to extract uranium and thorium. These wastes have relatively low concentrations of radioactive materials with long half-lives. Tailings contain radium (which, through radioactive decay, becomes radon), thorium, and small residual amounts of uranium that were not extracted during the milling process.

mined geologic disposal system. The high-level waste Federal repository for spent nuclear fuel and vitrified borosilicate waste glass.

mixed low-level waste. Waste that satisfies the definition of low-level radioactive waste (LLW) in the Low-Level Radioactive Waste Policy Amendments Act of 1985 and that contains hazardous waste that has at least on of the following characteristics: (1) is listed as a hazardous waste in Subpart D of 40 CFR Part 261, (2) exhibits any of the hazardous waste characteristics identified in Subpart C of 40 CFr part 261, or (3) contains PCB-containing wastes subject to regulation under the Toxic Substances Control Act and 40 CFR Parts 702-799.

mixed waste. Waste that contains both radioactive and hazardous chemical components.

mixed waste. Radioactive waste with a chemical component (classified as a hazardous waste) regulated by the Federal government or the states.

mixed wastes can be defined as radioactive wastes which also contain a "conventional" hazard, such as chemical toxicity. An example would be radioactive lead. If it wasn't radioactive, the lead would still be considered to be an environmental hazard in most countries. In some countries, notably the United States, the radioactive properties are regulated by one set of rules under the NRC, while the conventional hazard is regulated by another set of rules under the jurisdiction of another government agency (the EPA). This dual regulation greatly increases the complexity of mixed waste management, especially if the regulations impose conflicting requirements.

mixed waste (MW) MW contains both hazardous waste (as defined by RCRA and its amendments) and radioactive waste (as defined by AEA and its amendments). It is jointly regulated by NRC or NRC's Agreement States and EPA or EPA's RCRA Authorized States. The fundamental and most comprehensive statutory definition is found in the Federal Facilities Compliance Act (FFCA) where Section 1004(41) was added to RCRA: "The term 'mixed waste' means waste that contains both hazardous waste and source, special nuclear, or byproduct material subject to the Atomic Energy Act of 1954."

mixed transuranic waste (MTRU) MTRU contains both Transuranic (TRU) and hazardous wastes. Approximately 55% of DOE's TRU is MTRU.

mixed-oxide fuel. Nuclear reactor fuel composed of plutonium and uranium in oxide form.

mobility. The ability of radionuclides to move through food chains in the environment.

molten salt reactor. A nuclear reactor in which fissile and fertile material, in the form of fluoride salts, is dissolved in the coolant which is a molten mixture of salts such as lithium fluoride and beryllium fluoride. Also known as a fused-salt reactor.

MRS facility. A proposed facility for the monitored retrievable storage of spent nuclear fuel from commercial power plants. Such a facility would permit continuous monitoring, management, and maintenance of these wastes and provide for their ready retrieval for further processing or disposal.

N

National Emission Standards for Hazardous Air Pollutants (NESHAPs). The Clean Air Act established limits on the release of hazardous pollutants for which no ambient air quality standard is applicable. Under the March 7, 1989 proposed ruling NESHAPs will also address radioactive releases to the air.

National Contingency Plan (NCP). A short title for the National Oil and Hazardous Substance Pollution Contingency Plan. The NCP, 40 CFR Part 300, outlines the responsibilities and authorities for responding to releases into the environment of hazardous substances and other pollutants and contaminants under the statutory authority of CERCLA and section 311 of the Clean Water Act. The NCP is the principal statutory source for the performance of DOE decommissioning as a non-time critical removal action, when CERCLA applies.

National Environmental Policy Act (NEPA). A

Federal law, enacted in 1970, that requires the Federal Government to consider the environmental impacts of, and alternatives to, major proposed actions in its decision making processes. The act is the basic national charter for the protection of the environment. It requires the preparation of an Environmental Impact Statement for every major Federal action that may significantly affect the quality of the human or natural environment.

naturally occurring and accelerator-produced radioactive materials. Radioactive materials that are considered either naturally occurring and are not source, special nuclear, or by-product material or are produced in a charged particle accelerator.

naturally occurring radioactive materials (NORM) NORM is a subset of NARM and refers to materials not covered under the AEA whose radioactivity has been enhanced (radionuclide concentrations are either increased or redistributed where they are more likely to cause exposure to man) usually by mineral extraction or processing activities. Examples are exploration and production wastes from the oil and natural gas industry and phosphate slag piles from the phosphate mining industry. This term is not used to describe or discuss the natural radioactivity of rocks and soils, or background radiation, but instead refers to materials whose radioactivity is technologically enhanced by controllable practices.

naturally occurring or accelerator produced radioactive materials (NARM) Radioactive materials not covered under the AEA that are naturally occurring or produced by an accelerator. Accelerators are used in sub-atomic particle physics research. These materials have been traditionally regulated by States. A subset of NARM is NORM. NARM waste with more than 2 nCi/g of 226Ra or equivalent is commonly referred to as discrete NARM waste; below this threshold, the waste is referred to as diffuse NARM waste. NARM waste is not covered under the AEA, not a form of LLW, and is not regulated by NRC.

neutron. Uncharged particle in a nucleus. Neutrons are used to split heavy atoms in the fission reaction.

no migration variance petition. A process used to exempt a hazardous waste from land disposal prohibitions. The petition must show that there will be no movement of hazardous contaminants from a disposal unit during the time that the waste remains hazardous.

nonfuel components. Nuclear reactor core parts and hardware, excluding the nuclear fuel itself. Such components include shrouds, control rods, fuel channels, in-core chambers, support tubes, and dummy fuel rods.

NORM. Naturally Occurring Radioactive Material, regulated by the states, pipe scale from drilling for oil or natural gas is an example.

nuclear materials. Fissionable and/or fertile material that can be used as nuclear fuel or in the construction of nuclear weapons.

nuclear weapons complex. The chain of foundries, uranium enrichment plants, reactors, chemical separation plants, factories, laboratories, assembly plants, and test sites that produces nuclear weapons. Sixteen major United States facilities in 12 States form the nuclear weapons complex.

nuclear fuel cycle means the operations defined to be associated with the production of electrical power for public use by any fuel cycle through utilization of nuclear energy.

Nuclear Regulatory Commission. The Federal agency responsible for regulating the safety of commercial nuclear operations, including nuclear power plants and other commercial and medical uses of nuclear materials. See Atomic Energy Commission.

Nuclear Regulatory Commission (NRC) NRC is an independent regulatory agency created out of the Atomic Energy Commission in 1975 to regulate the civilian uses of nuclear material. Specifically, the NRC is responsible for ensuring that activities associated with the operation of nuclear power plants and fuel cycle plants, and medical, industrial, and research applications, are carried out with adequate protection of the public health and safety, the environment, and national security. At full complement, the NRC has five

Commissioners nominated by the President and confirmed by the Senate; the President designates one of the Commissioners as Chairman. NRC regulates all commercial AEA materials. Except in a few cases, NRC does not regulate DOE. NRC does not regulate NARM.

O

Office of Civilian Radioactive Waste Management. A Department of Energy office responsible for the management and disposal of spent nuclear fuel from commercial nuclear reactors and high-level radioactive waste from defense activities.

P

parent. A radionuclide that upon decay yields a specified nuclide (the daughter) either directly or as a later member of a radioactive decay series.

passive soil vapor extraction. A technology that injects pressurized air below the soil's surface to force contaminants through the soil. Contaminants are then collected, mixed with natural gas, and incinerated. Finally, the cleaned air is returned to the environment.

pathway analysis: An analysis of the ways in which toxic or radioactive substances can reach human beings from a factory, place, or process in which they are made, used, stored or dumped via air, water, soil, the food chain, or some combination of these pathways.

plasma hearth furnace process. A technology that uses heat and pressure to create "plasma" or highly charged gas. Drums of waste are loaded into the unit's furnace and heated with the gas torch. The technology is very effective at handling multiple waste types, destroying organic compounds, and vitrifying radionuclides and heavy metals. Also called the plasma melter technology.

plume. A three-dimensional area, usually in air or ground water, containing measurable concentrations of a compound or element that has migrated from its source point.

plutonium oxide. A poisonous, radioactive, pyrophoric oxide of plutonium. Its particles are readily airborne.

plutonium: A highly toxic, heavy, radioactive metallic element. There are 15 isotopes of plutonium, of which only five are produced in significant quantities: plutonium-238, -239, -240, -241, and -242. Plutonium-239 is the most important plutonium isotope as it is fissile and is used in nuclear weapons and some reactors. One the other hand, plutonium-240 is unsuitable for use in nuclear weapons and reactor fuel. Thus, in a reactor whose main purpose is plutonium production, the rate at which plutonium-240 is formed controls the length of time fuel is allowed to remain under irradiation. Plutonium is categorized according to plutonium-240 content, as follows: super-grade has 2-3% Pu-240; weapons-grade has less than 7% Pu-240; fuel-grade has 7-18 (or sometimes given as 7-19) % Pu-240; and reactor-grade has 18 or greater (or 19 or greater) % Pu-240. (Note: Despite what the name implies, "reactor-grade" plutonium has been used successfully to make a nuclear bomb.)

plutonium. A man-made fissile element. Pure plutonium is a silvery metal heavier than lead. The plutonium-239 isotope is the variant preferred for manufacturing nuclear weapons, although any plutonium can be used. Plutonium-239 has a half-life of 24,000 years.

polychlorinated biphenyls. More commonly known as PCBs. A family of colorless, odorless compounds used in industrial applications throughout the nuclear weapons complex. Polychlorinated biphenyls are found in many gaskets and large electrical transformers and capacitors in gaseous diffusion plants. They have proven to be toxic to both humans and laboratory animals. Polychlorinated biphenyls are noted for their flame retardance and thermal stability.

polycyclic aromatic hydrocarbons (PAHs). PAHs are potentially mutagenic and carcinogenic substances occurring in various concentrations in the atmosphere, soil, water and sediment. PAHs, inherited both from natural and anthropogenic processes, are

persistent organic pollutants (POP) due to their chemical stability and biodegradation resistance. The increase of road transportation, and of industrial and agricultural activities has led to a notable build up of PAHs in the environmental media.

pressurized water reactor (PWR). A light-water-cooled reactor operated at high pressure without boiling.

pump-and-treat system. A system which extracts ground water and removes contaminating substances before returning the water (e.g., recharge in injection wells) or disposing of it elsewhere.

PUREX^TM Process. A solvent extraction process that may be used in the reprocessing of uranium/plutonium-based nuclear fuels.

R

rad: A unit of absorbed dose of radiation defined as deposition of 100 ergs of energy per gram of tissue. It amounts to approximately one ionization per cubic micron.

rad (radiation absorbed dose). The amount, or dose, of ionizing radiation absorbed by any material, such as human tissue.

radiation means any or all of the following: Alpha, beta, gamma, or X-rays; neutrons; and high-energy electrons, protons, or other atomic particles; but not sound or radio waves, nor visible, infrared, or ultraviolet light.

radiation. Particles or waves from atomic or nuclear processes (or from certain machines). Prolonged exposure to these particles and rays may be harmful.

radioactive waste. Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and is of negligible economic value considering recovery costs.

radioactive Waste. In general, radioactive waste classes are based on the waste's origin, not on the physical and chemical properties of the waste that could determine its safe management. Other categories of radioactive waste not listed here include mixed waste and NARM wastes (Naturally-Occurring and Accelerator-Produced Radioactive Materials). One common factor for all categories of nuclear waste is the presence of at least some amount of long-lived radionuclides.

radioactive waste, as used in this part, means the high-level and transuranic radioactive waste covered by this part.

radioactive material means any material which spontaneously emits radiation.

radioactive material means matter composed of or containing radionuclides, with radiological half-lives greater than 20 years, subject to the Atomic Energy Act of 1954, as amended.

radioactive. Of, caused by, or exhibiting radioactivity.

radioactivity: The spontaneous discharge of radiation from atomic nuclei. This is usually in the form of beta or alpha radiation, together with gamma radiation. Beta or alpha emission results in transformation of the atom into a different element, changing the atomic number by +1 or -2 respectively.

radioactivity. The spontaneous emission of radiation from the nucleus of an atom. Radionuclides lose particles and energy through this process.

radioactivity. The spontaneous emission of radiation from the nucleus of an atom. Radioisotopes of elements lose particles and energy through this process of radioactive decay.

radiography system. A system that transmits a beam of x-rays or gamma rays through an opaque specimen onto an adjacent photographic film to produce a photographic image. The image results from variations in thickness, density, and chemical composition of a specimen. This technique has many applications in medicine and industry.

radioisotope. An unstable isotope of an element that will eventually undergo radioactive decay (i.e., disintegration).

radionuclide. A radioactive species of an atom. Tritium, strontium-90, and uranium-235 are radionuclides.

radionuclide. A radioactive species of an atom characterized by the constitution of its nucleus; in nuclear medicine, an atomic species emitting ionizing radiation and capable of existing for a measurable time, so that it may be used to image organs and tissues.

radon. A chemical element, atomic number 86, that is a radioactive gas produced by the decay of one of the daughters of radium.

radon. A radioactive gas that is produced by the decay of one of the daughters of radium. Radon is hazardous in unventilated areas because it can build up to high concentrations and, if inhaled for long periods of time, may induce lung cancer.

rapid geophysical surveyor. A manually maneuvered vehicle that uses magnetic meters and data-gathering instruments to collect information on buried waste. Used to map and identify metallic waste.

reactivity. The relative capacity of an atom, molecule, or radical to combine chemically with another atom, molecule, or radical. Also, a measure of the deviation of a nuclear reactor from the critical state at any instant of time such that positive and negative values correspond to reactors above and below critical, respectively.

reinserted fuel. Irradiated reactor fuel that is discharged in one cycle and inserted in to the same reactor during a subsequent refueling. In a few cases, fuel discharged from one reactor has been used to fuel a different reactor.

relative biological effectiveness (RBE): A factor that is used to express the relative amount of biological change caused by a unit of energy deposited by a particular type of ionizing radiation into a specific part of the body. The RBE is complex and organ-specific. Due to its complexity, a simple parameter, called the quality factor, is applied to different types of radiation as a matter of regulatory practice for the purpose of estimating biological damage and the resulting cancer risk.

relative biological effectiveness (RBE): A factor that can be determined for different types of ionizing radiation, representing the relative amount of biological change caused by 1 rad. It depends upon the density of ionization along the tracks of the ionizing particles, being highest for the heavy particles: alpha rays and neutrons.

release site. A location at which hazardous, radioactive, or mixed waste release has occurred or is suspected to have taken place. Release sites usually are associated with areas where hazardous, radioactive, mixed waste, or waste-contaminated substances have been used, treated, stored, migrated, and/or dispositioned.

release. "spilling, leaking, pumping, pouring, emitting, emptying, discharge, injecting, escaping, leaching dumping, or disposing" of a hazardous substance, pollutant, or contaminant into the environment (40 CFR 300.5). This includes the abandonment or disposal of barrels or other closed receptacles containing hazardous substances, pollutants, or contaminants. The NCP also defines the term release to include a threat of release (40 CFR 300.5)

rem: A unit of equivalent absorbed dose of radiation, taking account of the relative biological effectiveness of the particular radiation. The dose in rems is the dose in rads multiplied by the RBE.

rem (roentgen equivalent man). Unit used in radiation protection to measure the amount of damage to human tissue from a dose of ionizing radiation.

rem. Roentgen equivalent man. Unit used in radiation protection to measure the amount of damage to human tissue from a dose of ionizing radiation.

remedial action. Steps taken to clean up inactive sites and facilities that were contaminated by past activities.

remediation. The process of cleaning up a site where a hazardous substance has been released.

remote handling. The use of robotics to perform activities too hazardous for humans, such as disassembling bombs or preparing certain wastes for disposal.

removal action. Short-term, immediate action taken to address releases or threatened releases of hazardous substances that require expedited response.

repository, geologic. A facility that has an excavated subsurface system for the permanent disposal of spent nuclear fuel and high-level waste.

repository. A permanent disposal facility for high-level or transuranic waste and spent nuclear fuel. See mined geologic disposal system.

repository. A permanent disposal facility for high-level or transuranic wastes and spend fuel.

reprocessing, fuel. The chemical/mechanical processing of irradiated nuclear reactor fuel to remove fission products and recover fissile and fertile materials.

reprocessing: The chemical separation of irradiated nuclear fuel into uranium, plutonium, and fission products.

reprocessing. The process by which spent nuclear fuel is separated into waste material for disposal and into material such as uranium and plutonium to be reused.

residual radioactive material means: (1) Waste (which the Secretary determines to be radioactive) in the form of tailings resulting from the processing of ores for the extraction of uranium and other valuable constituents of the ores; and (2) Other wastes (which the Secretary determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials.

residue. Scrap and compounds generated from the processing, fabrication, or recycling of nuclear materials.

resin. A synthetic material used for ion exchange or a high-molecular-weight organic material (i.e., glue, epoxy) used to solidify liquid materials.

Resource Conservation and Recovery Act (RCRA). A Federal law enacted in 1976 to address the treatment, storage, and disposal of hazardous waste.

Resource, Conservation, and Recovery Act (RCRA) RCRA gave EPA authority to control hazardous waste from "cradle-to-grave." This includes the minimization, generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. RCRA focuses only on active and future facilities and does not address abandoned or historical sites (see CERCLA).

retention basin. A double-lined lagoon with floating covers and leachate collection systems used interim storage of large volumes of liquid waste.

roscoelite ore. Ore containing a tan, grayish-brown, or greenish-brown vanadium-bearing mica material occurring in minute scales or flakes.

Rover fuel process. The process used in the entire United State's experimental nuclear rocket program, including the Kiwi, Phoebus, and Nerva series.

S

salt cake. A salt form of high-level waste stored in tanks, which is produced from neutralizing acidic liquid waste from defense reactor fuel reprocessing with an alkaline agent (caustic soda).

saltstone facility. A facility at the Savannah River Site that treats and disposes of low-level liquid radioactive waste by mixing it with cement flyash and slag; the mixture is allowed to harden in above-ground vaults.

sanitary waste. Waste, such as garbage, that is generated by normal housekeeping activities and is not hazardous or radioactive. The waste is disposed of in sanitary landfills. Sanitary waste also includes liquids which are treated in sewage treatment plants.

scintillation liquids. Organic chemical solutions that produce light when bombarded with radiation. These liquids are a major component of institutional low-level wastes.

scrap metal. Any metal cutting or reject from a manufacturing operation that may be suitable for recycling.

sea dumping (disposal). The practice of periodically dumping shiploads of drummed, solidified waste into the ocean at specified locations. (No longer performed).

sea-bed disposal. Placement of waste packages in deep ocean sediments.

SER. Safety Evaluation Report.

separative work unit. The standard measure of enrichment services. The separative work unit (SWU) is expressed as a unit of mass. For example, 1 kilogram of separative work is expressed as 1 kg SWU.

shale. Compacted clay rock.

shielding. Materials, usually concrete, water, steel, and lead, placed around radioactive material to protect people against the danger of radiation.

SIER. Siting Investigation Evaluation Report.

sievert: A unit of equivalent absorbed dose equal to 100 rems.

single-shell tanks. Liquid storage tanks with a single liner of carbon/steel. Single-shell tanks are no longer used for high-level waste storage because waste can leak directly into the ground without detection.

slurry, high-level waste. A watery mixture of highly radioactive, insoluble matter.

small quantity generator. A generator which produces between 220 pounds and 2,200 pounds of hazardous waste a month. Other categories of generators include conditionally exempt small quantity generators which produce less than 220 pounds per month and large quantity generators which produce more than 2,200 pounds per month.

soil washing. In this process, soil is excavated and scrubbed to remove contaminants in one of two ways: by dissolving or suspending them in a water-based wash; or by concentrating them into a smaller volume of soil through particle size separation, gravity separation, and attrition scrubbing. Soil washing is done to reduce the volume of waste requiring disposal.

solar ponds. Ponds that receive water to be evaporated by the sun.

solid waste. Non-liquid, non-soluble material ranging from municipal garbage to industrial waste that contains complex, and sometimes hazardous, substances. Solid waste also includes sewage sludge, agricultural refuse, demolition waste, and residues. Technically, solid waste also refers to liquids and gases in containers.

solid waste As defined under RCRA, any solid, semi-solid, liquid, or contained gaseous materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities. Solid waste includes garbage, construction debris, commercial refuse, sludge from water supply or waste treatment plants, or air pollution control facilities, and other discarded materials. Solid waste does not include solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Clean Water Act or source, special nuclear, or byproduct material as defined by the AEA.

solvent extraction. The separation of materials of different chemical types by exploiting the relative chelating ability of different chemicals which preferentially dissolve in one of the two phases. In spent nuclear fuel reprocessing, liquid-liquid contact of two immiscible solvent (one aqueous, one organic) permits recovery and separation of uranium and plutonium in one phase and fission products in the other phase.

source term (IDB program use age). A set of qualitative and quantitative features used to describe the origin and concentration of radioactive waste. The qualitative features include a flowchart of waste streams generated by a facility or an activity. Quantitative features include (1) the number of curies of radioactivity expressed either per unit of facility production or per unit of waste volume or mass and (2) a listing of the relative concentrations of component radioisotopes per curies of waste activity.

source material. (1) material containing any combination of uranium or thorium in any physical or chemical for, or (2) ores containing 0.05 wt% or more uranium, thorium, or both.

Source material excludes special nuclear material.

source material means (1) uranium, thorium, or any other material which is determined by the Commission pursuant to the provisions of section 61 [42 USCS § 2091] to be source material; or (2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time.

source material. Source Material is the Uranium or Thorium ores mined from the Earth. Source material is defined in 10 CFR 20.1003 as "(1) Uranium, or thorium or any combination of uranium and thorium in any physical or chemical form; or (2) Ores that contain, by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination or uranium and thorium. Source material does not include special nuclear material."

source term. The amount and type of radioactive material released into the environment in the case of a severe nuclear accident.

special case waste. Radioactivity waste that is currently stored throughout the DOE complex for which a management strategy beyond indefinite storage does not currently exist.

special nuclear material. Plutonium or uranium enriched to a higher-than-natural assay. Includes plutonium-239, uranium-233, uranium containing more than the natural abundance of uranium-235, or any material artificially enriched in one of these isotopes.

special nuclear material (SNM) SNM is defined in 10 CFR 20.1003 as "(1) Plutonium, uranium-233, uranium enriched in the isotope 233 or in isotope 235, and any other material that the NRC, pursuant to the provisions of section 51 of the AEA, determines to be SNM, but does not include source material; (2) or any material artificially enriched by any of the foregoing but does not include source material." SNM is important in the fabrication of weapons grade materials and as such has strict licensing and handling controls.

special nuclear material means (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 [42 USCS § 2071], determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material.

specific activity: A measure of the radioactivity of a unit weight (generally one gram) of material.

spent nuclear fuel. Fuel that has been "burned" (irradiated) in a nuclear power plant's reactor to the point where it no longer contributes efficiently to the nuclear chain reaction. Spent fuel is hot and highly radioactive.

spent nuclear fuel means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

spent fuel. Fuel that has been "burned" (irradiated) in a nuclear power plant's reactor to the point where it no longer contributes efficiently to the nuclear chain reaction. Spent fuel is thermally hot and highly radioactive.

spent nuclear fuel means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

stabilization. Conversion of active organic matter in sludge into inert, harmless material. Often undertaken to limit the mobility of toxic chemicals. Also includes the activities needed to reduce the active management required for disposal facilities.

standard contract. A contract between DOE and each commercial owner or generator or irradiated nuclear fuel. As indicated in 10 CFR Part 961, the contract specifies the terms and methods of payment, how fees are to be calculated, and how spent nuclear fuel is to be transferred to DOE custody.

storage means retention of spent nuclear fuel or radioactive wastes with the intent and capability to readily retrieve such fuel or waste for subsequent use, processing, or disposal.

storage means retention of high-level radioactive

waste, spent nuclear fuel, or transuranic waste with the intent to recover such waste or fuel for subsequent use, processing, or disposal.

storage. Operations that are designed to provide isolation and easy recovery of radioactive material, and which rely on continuous human monitoring, maintenance, and protection from human intrusion for a specified period of time.

storage-in-decay. Radioactive elements will breakdown and yield energetic gamma rays and x-rays and particles. After enough time has elapsed (usually ten half-lives) the material has decayed to a point were a radiation survey meter cannot distinguish between it and natural background radiation levels.

subproject. A treatment process within the Ohio Mobil Chemical Treatment Preferred Option which is required for certain constituents within waste streams.

T

Tailings means the remaining portion of a metal-bearing ore after some or all of such metal, such as uranium, has been extracted.

tailings. Solid wastes produced from primary processing of ores.

tank farm. Area in which a number of large-capacity storage tanks are located. The Department uses tank farms to store high-level radioactive waste.

thermal power. A measure of the rate of heat-energy emission that results from the radioactive decay of a material. A unit of thermal power commonly used is the watt (W).

THOREX process. A solvent extraction process developed to reprocess thorium-based nuclear fuels.

thorium. An element of the actinium series that is soft, radioactive, soluble in acids, and insoluble in water and alkalies. Thorium is a potential source of nuclear energy and also has been used in the manufacture of lantern mantles and sun lamps. It is a by-product of uranium decay.

threshold hypothesis. A radiation-dose-consequence hypothesis that holds that biological radiation effects will occur only above some minimum dose.

Toxic Substances Control Act. This act was enacted in 1976 to protect human health and the environment from unreasonable risk caused by exposure to or the manufacture, distribution, use, or disposal of or exposure to substances containing toxic chemicals. For example, under this act, any hazardous waste containing more than 50 parts per million of polychlorinated biphyls is subject to regulation.

transuranic waste nondestructive assay/nondestructive examination. Nondestructive test procedures performed on suspect transuranic waste to determine their transuranic isotope concentration. From these test such waste can be properly classified (certified) as transuranic or low-level.

transuranic waste, remote-handled. Transuranic waste with a surface dose rate of greater than 200 mrem/h.

transuranic waste. Waste generated from manmade radionuclides, regulated by the Federal government, this material is generated at Department of Energy sites and disposed of at the Waste Isolation Pilot Project (WIPP) in Carlsbad, New Mexico.

transuranic waste (TRU). Waste that is contaminated with alpha-emitting transuranium radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram at the time of assay. Most transuranic waste was created in the nuclear weapons production process. The category transuranic waste does not specify source or form. It contains hazardous constituents regulated under RCRA Subtitle C.

transuranic waste acceptance criteria. A set of requirements/criteria that must be satisfied prior to transport to and emplacement in the Waste Isolation Pilot Plant for disposal.

transuranic waste, contact-handled. Transuranic waste with a surface dose rate of less than 200 mrem/h.

transuranic waste (TRU). Waste materials contaminated with U-233 (and its daughter

products), certain isotopes of plutonium, and nuclides with atomic number greater than 92 (uranium). It is produced primarily from reprocessing spend fuel and from use of plutonium in fabrication of nuclear weapons.

transuranic waste (TRU) Waste containing elements with atomic numbers (number of protons) greater than 92, the atomic number of uranium. (Thus the term "transuranic," or "above uranium.") TRU includes only waste material that contains transuranic elements with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram. If the concentrations of the half-lives are below the limits, it is possible for waste to have transuranic elements but not be classified as TRU waste.

transuranic radioactive waste, as used in this part, means waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes, with half-lives greater than twenty years, per gram of waste, except for: (1) High-level radioactive wastes; (2) wastes that the Department has determined, with the concurrence of the Administrator, do not need the degree of isolation required by this part; or (3) wastes that the Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

transuranic waste means material contaminated with elements that have an atomic number greater than 92, including neptunium, plutonium, americium, and curium, and that are in concentrations greater than 10 nanocuries per gram, or in such other concentrations as the Nuclear Regulatory Commission may prescribe to protect the public health and safety.

treatment. Any method, technique, or process designed to change the physical or chemical character of waste to render it less hazardous; make it safer to transport, store, or dispose of; or reduce its volume.

tuff. A rock composed of compacted volcanic ash and dust; it is usually porous and soft.

U

uranium mill tailings. The sand-like materials left over from the separation of uranium from its ore. More than 99 percent of the ore becomes tailings.

uranium milling. The process of separating uranium from mined ore.

uranium fuel cycle means the operations of milling of uranium ore, chemical conversion of uranium, isotopic enrichment of uranium, fabrication of uranium fuel, generation of electricity by a light-water-cooled nuclear power plant using uranium fuel, and reprocessing of spent uranium fuel, to the extent that these directly support the production of electrical power for public use utilizing nuclear energy, but excludes mining operations, operations at waste disposal sites, transportation of any radioactive material in support of these operations, and the reuse of recovered non-uranium special nuclear and by-product materials from the cycle.

Uranium Mill Tailings Radiation Control Act. This act, passed in 1978, directed the Department of Energy to stabilize and control uranium mill tailings from inactive sites in a safe and environmentally sound manner to minimize radiation health hazards to the public. The act authorized the Department to undertake remedial actions at 24 designated inactive uranium processing sites and at approximately 5,000 vicinity properties. The Uranium Mill Tailings Remedial project was created to handle the cleanup.

Uranium Mill Tailings Remedial Action project (UMTRA). The world's largest materials management project ever undertaken to reduce or eliminate risk to the general public from exposure to potentially hazardous and radioactive materials. This project details the responsibility for encapsulating and isolating almost one-fourth of all the uranium mill tailings generated across the entire United States (more than 44 million cubic yards).

uranium. The basic material for nuclear technology. Uranium is a slightly radioactive naturally occurring heavy metal that is more dense than lead. It is a heavy, silvery-white

metallic element with an atomic number of 92. Uranium is 40 times more common than silver.

URCB. Utah Radiation Control Board

V

vicinity properties. A real property in the vicinity of a radioactive materials processing site that has become radioactively contaminated as a result of site activities.

vitrification. Vitrification is the process of converting materials into a glass-like substance, typically through a thermal process. Radionuclides and other inorganics are chemically bonded in the glass matrix. Consequently vitrified materials generally perform very well in leach tests. EPA has specified, under the land disposal restrictions, vitrification to be the treatment technology for high-level waste (55 FR 22627, June 1, 1990).

vitrification. A conversion process that stabilizes radioactive nuclear waste by mixing it with molten glass. The molten glass is then poured into metal canisters where it solidifies.

volume reduction. Various methods of waste treatment, such as evaporation for liquids or compaction for solids, aimed at reducing the volume of waste.

volume reduction. Various methods of waste treatment, such as evaporation for liquids or compaction for solids, aimed at reducing the volume of waste.

voluntary corrective measures. Remedial actions at a site which are completed outside of a RCRA- or CERCLA-mandated action but may be subject to third-party oversight.

W

waste minimization. An action that economically avoids or reduces the generation of waste by reducing its source, decreasing the toxicity of hazardous waste, improving energy usage, or instituting recycling. In addition, minimization efforts must reduce present and future threats to human health, safety, and the environment.

waste management. Activities that include treating, storing, and disposing of a variety of wastes, including high-level radioactive, transuranic, low-level radioactive, low-level mixed, hazardous chemical, and sanitary waste.

waste stream. Waste (liquid, solid, or gas) leaving a facility or operation.

waste. Material that has no identifiable future use for which suitable disposal must be found.

wastewater. Spent or used water from individual residences, communities, farms, or industries that contains dissolved or suspended matter.

wet storage. Storage of spent nuclear fuel in a pool of water, usually to cool spent fuel assemblies and protect workers.

WVDP: West Valley Demonstration Plant, the name of the vitrification plant for high-level radioactive wastes at West Valley, New York.

Y

yellowcake. A uranium oxide concentrate that results from milling (concentrating) uranium ore. It typically contains 80 to 90 wt % U308.

UTAH CODE ANNOTATED
Radioactive Waste Definitions

Radioactive Waste

(4) "Class B and class C low-level radioactive waste" has the same meaning as in 10 CFR 61.55 **(SEE BELOW)**.

10 CFR 61.55

10 CFR 61.55
§ 61.55 Waste classification.

(a) Classification of waste for near surface disposal. (1) Considerations. Determination of the classification of radioactive waste involves two considerations. First, consideration must be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration must be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are effective.

(2) Classes of waste. (i) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in § 61.56(a). If Class A waste also meets the stability requirements set forth in § 61.56(b), it is not necessary to segregate the waste for disposal.

(ii) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in § 61.56.

(iii) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in § 61.56.

(iv) Waste that is not generally acceptable for near-surface disposal is waste for which form and disposal methods must be different, and in general more stringent, than those specified for Class C waste. In the absence of specific requirements in this part, such waste must be disposed of in a geologic repository as defined in part 60 or 63 of this chapter unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission.

(3) Classification determined by long-lived radionuclides. If radioactive waste contains only radionuclides listed in Table 1, classification shall be determined as follows:

(i) If the concentration does not exceed 0.1 times the value in Table 1, the waste is Class A.

(ii) If the concentration exceeds 0.1 times the value in Table 1 but does not exceed the value in Table 1, the waste is Class C.

(iii) If the concentration exceeds the value in Table 1, the waste is not generally acceptable for near-surface disposal.

(iv) For wastes containing mixtures of radionuclides listed in Table 1, the total concentration shall be determined by the sum of fractions rule described in paragraph (a)(7) of this section.

Table 1

Radionuclide	Concentration curies per cubic meter
C-14	8
C-14 in activated metal	80
Ni-59 in activated metal	220
Nb-94 in activated metal	0.2
Tc-99	3
I-129	0.08
Alpha emitting transuranic nuclides with half-life greater than 5 years	fn1100
Pu-241	fn13,500
Cm-242	fn120,000

fn1 Units are nanocuries per gram.

(4) Classification determined by short-lived radionuclides. If radioactive waste does not contain any of the radionuclides listed in Table 1, classification shall be determined based on the concentrations shown in Table 2. However, as specified in paragraph (a)(6) of this section, if radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.

(i) If the concentration does not exceed the value in Column 1, the waste is Class A.

(ii) If the concentration exceeds the value in Column 1, but does not exceed the value in Column 2, the waste is Class B.

(iii) If the concentration exceeds the value in Column 2, but does not exceed the value in Column 3, the waste is Class C.

(iv) If the concentration exceeds the value in Column 3, the waste is not generally acceptable for near-surface disposal.

(v) For wastes containing mixtures of the nuclides listed in Table 2, the total concentration shall be determined by the sum of fractions rule described in paragraph (a)(7) of this section.

Table 2

Radionuclide	Concentration, curies per cubic meter		
	Col. 1	**Col. 2**	**Col. 3**
Total of all nuclides with less than			
5 year half life	700	(fn1)	(fn1)
H-3	40	(fn1)	(fn1)
Co-60	700	(fn 1)	(fn1)
Ni-63	3.5	70	700
Ni-63 in activated metal	35	700	7000
Sr-90	0.04	150	7000
Cs-137	1	44	46 00

fn1 There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other nuclides in Table 2 determine the waste to the Class C independent of these nuclides.

(5) Classification determined by both long- and short-lived radionuclides. If radioactive waste contains a mixture of radionuclides, some of which are listed in Table 1, and some of which are listed in Table 2, classification shall be determined as follows:

(i) If the concentration of a nuclide listed in Table 1 does not exceed 0.1 times the value listed in Table 1, the class shall be that determined by the concentration of nuclides listed in Table 2.

(ii) If the concentration of a nuclide listed in Table 1 exceeds 0.1 times the value listed in Table 1 but does not exceed the value in Table 1, the waste shall be Class C, provided the concentration of nuclides listed in Table 2 does not exceed the value shown in Column 3 of Table 2.

(6) Classification of wastes with radionuclides other than those listed in Tables 1 and 2. If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.

(7) The sum of the fractions rule for mixtures of radionuclides. For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each nuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits must all be

taken from the same column of the same table. The sum of the fractions for the column must be less than 1.0 if the waste class is to be determined by that column. Example: A waste contains Sr-90 in a concentration of 50 Ci/m3. and Cs-137 in a concentration of 22 Ci/m3. Since the concentrations both exceed the values in Column 1, Table 2, they must be compared to Column 2 values. For Sr-90 fraction 50/150=0.33; for Cs-137 fraction, 22/44=0.5; the sum of the fractions=0.83. Since the sum is less than 1.0, the waste is Class B.

(8) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram.

Utah Code

(7) (a) "High-level nuclear waste" means spent reactor fuel assemblies, dismantled nuclear reactor components, and solid and liquid wastes from fuel reprocessing and defense-related wastes.

(b) "High-level nuclear waste" does not include medical or institutional wastes, naturally-occurring radioactive materials, or uranium mill tailings.

(8) (a) "Low-level radioactive waste" means waste material which contains radioactive nuclides emitting primarily beta or gamma radiation, or both, in concentrations or quantities which exceed applicable federal or state standards for unrestricted release.

(b) "Low-level radioactive waste" does not include waste containing more than 100 nanocuries of transuranic contaminants per gram of material, nor spent reactor fuel, nor material classified as either high-level waste or waste which is unsuited for disposal by near-surface burial under any applicable federal regulations.

(9) "Radiation" means ionizing and nonionizing radiation, including gamma rays, X-rays, alpha and beta particles, high speed electrons, and other nuclear particles.

(10) "Radioactive" means any solid, liquid, or gas which emits radiation spontaneously from decay of unstable nuclei.

(4) (a) "Low-level waste" means waste material which contains radioactive nuclides emitting primarily beta or gamma radiation, or both, in concentrations or quantities which exceed applicable federal or state standards for unrestricted release.

(b) "Low-level waste" does not include waste containing more than ten nanocuries of transuranic contaminants per gram of material, nor spent reactor fuel, nor material classified as either high-level waste or waste which is unsuited for disposal by near-surface burial under any applicable federal regulations.

3) "Greater than class C radioactive waste" means low-level radioactive waste that has higher concentrations of specific radionuclides than allowed for class C waste.

HAZARDOUS WASTE GLOSSARY

A

Above ground tank means a device meeting the definition of "tank" in § 260.10 and that is situated in such a way that the entire surface area of the tank is completely above the plane of the adjacent surrounding surface and the entire surface area of the tank (including the tank bottom) is able to be visually inspected.

Act or RCRA means the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. section 6901 et seq.

Active life of a facility means the period from the initial receipt of hazardous waste at the facility until the Regional Administrator receives certification of final closure.

Active portion means that portion of a facility where treatment, storage, or disposal operations are being or have been conducted after the effective date of part 261 of this chapter and which is not a closed portion. (See also "closed portion" and "inactive portion".)

Administrator means the Administrator of the Environmental Protection Agency, or his designee.

Ancillary equipment means any device including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps, that is used to distribute, meter, or control the flow of hazardous waste from its point of generation to a storage or treatment tank(s), between hazardous waste storage and treatment tanks to a point of disposal onsite, or to a point of shipment for disposal off-site.

Aquifer means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs.

Authorized representative means the person responsible for the overall operation of a facility or an operational unit (i.e., part of a facility), e.g., the plant manager, superintendent or person of equivalent responsibility.

B

Battery means a device consisting of one or more electrically connected electrochemical cells which is designed to receive, store, and deliver electric energy. An electrochemical cell is a system consisting of an anode, cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term battery also includes an intact, unbroken battery from which the electrolyte has been removed.

Boiler means an enclosed device using controlled flame combustion and having the following characteristics: (1)(I) The unit must have physical provisions for recovering and exporting thermal energy in the form of steam, heated fluids, or heated gases; and (ii) The unit's combustion chamber and primary energy recovery sections(s) must be of integral design. To be of integral design, the combustion chamber and the primary energy recovery section(s) (such as waterwalls and superheaters) must be physically formed into one manufactured or assembled unit. A unit in which the combustion chamber and the primary energy recovery section(s) are joined only by ducts or connections carrying flue gas is not integrally designed; however, secondary energy recovery equipment (such as economizers or air preheaters) need not be physically formed into the same unit as the combustion chamber and the primary energy recovery section. The following units are not precluded from being boilers solely because they are not of integral design: process heaters (units that transfer energy directly to a process stream), and fluidized bed combustion units; and (iii) While in operation, the unit must maintain a thermal energy recovery efficiency of at least 60 percent, calculated in terms of the recovered energy compared with the thermal value of the fuel; and (iv) The unit must export and utilize at least 75 percent of the recovered energy, calculated on an annual basis. In this calculation, no credit shall be given for recovered heat used internally in the same unit. (Examples of internal use are the preheating of fuel or combustion air, and the driving of induced or forced draft fans or feedwater pumps); or (2) The unit is one

which the Regional Administrator has determined, on a case-by-case basis, to be a boiler, after considering the standards in § 260.32.

Bottom ash means the solid material that remains on a hearth or falls off the grate after thermal processing is complete.

C

Carbon regeneration unit means any enclosed thermal treatment device used to regenerate spent activated carbon.

Certification means a statement of professional opinion based upon knowledge and belief.

Closed portion means that portion of a facility which an owner or operator has closed in accordance with the approved facility closure plan and all applicable closure requirements. (See also "active portion" and "inactive portion".)

Combustibles means materials that can be ignited at a specific temperature in the presence of air to release heat energy.

Component means either the tank or ancillary equipment of a tank system.

Confined aquifer means an aquifer bounded above and below by impermeable beds or by beds of distinctly lower permeability than that of the aquifer itself; an aquifer containing confined ground water.

Container means any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.

Containment building means a hazardous waste management unit that is used to store or treat hazardous waste under the provisions of subpart DD of parts 264 or 265 of this chapter.

Contingency plan means a document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

Corrosion expert means a person who, by reason of his knowledge of the physical sciences and the principles of engineering and mathematics, acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such a person must be certified as being qualified by the National Association of Corrosion Engineers (NACE) or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control on buried or submerged metal piping systems and metal tanks.

D

Design capacity means the weight of solid waste of a specified gross calorific value that a thermal processing facility is designed to process in 24 hours of continuous operation; usually expressed in tons per day.

Designated facility means a hazardous waste treatment, storage, or disposal facility which (1) has received a permit (or interim status) in accordance with the requirements of parts 270 and 124 of this chapter, (2) has received a permit (or interim status) from a State authorized in accordance with part 271 of this chapter, or (3) is regulated under § 261.6©)(2) or subpart F of part 266 of this chapter, and (4) that has been designated on the manifest by the generator pursuant to § 260.20. If a waste is destined to a facility in an authorized State which has not yet obtained authorization to regulate that particular waste as hazardous, then the designated facility must be a facility allowed by the receiving State to accept such waste.

Destination facility. means a facility that treats, disposes of, or recycles a particular category of universal waste, except those management activities described in paragraphs (a) and ©) of §§ 273.13 and 273.33 of this chapter. A facility at which a particular category of universal waste is only accumulated, is not a destination facility for purposes of managing that category of universal waste.

Destination facility means a facility that treats, disposes of, or recycles a particular category of universal waste, except those management activities described in paragraphs (a) and ©) of §§ 273.13 and 273.33 of this chapter. A facility at which a particular category of universal waste is only accumulated, is not a destination facility for purposes of managing that category of universal waste.

Dike means an embankment or ridge of either

natural or man-made materials used to prevent the movement of liquids, sludges, solids, or other materials.

Dioxins and furans (D/F) means tetra, penta, hexa, hepta, and octa-chlorinated dibenzo dioxins and furans.

Discharge means water-borne pollutants released to a receiving stream directly or indirectly or to a sewerage system.

Discharge or hazardous waste discharge means the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on any land or water.

Discharge or hazardous waste discharge means the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on any land or water.

Disposal facility means a facility or part of a facility at which hazardous waste is intentionally placed into or on any land or water, and at which waste will remain after closure. The term disposal facility does not include a corrective action management unit into which remediation wastes are placed.

Disposal means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

Drip pad is an engineered structure consisting of a curbed, free-draining base, constructed of non-earthen materials and designed to convey preservative kick-back or drippage from treated wood, precipitation, and surface water run-on to an associated collection system at wood preserving plants.

E

Elementary neutralization unit means a device which: (1) Is used for neutralizing wastes that are hazardous only because they exhibit the corrosivity characteristic defined in § 261.22 of this chapter, or they are listed in subpart D of part 261 of the chapter only for this reason; and (2) Meets the definition of tank, tank system, container, transport vehicle, or vessel in § 260.10 of this chapter.

Emission means gas-borne pollutants released to the atmosphere.

EPA hazardous waste number means the number assigned by EPA to each hazardous waste listed in part 261, subpart D, of this chapter and to each characteristic identified in part 261, subpart C, of this chapter.

EPA identification number means the number assigned by EPA to each generator, transporter, and treatment, storage, or disposal facility.

EPA region means the states and territories found in any one of the following ten regions: Region I – Maine, Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island. Region II – New York, New Jersey, Commonwealth of Puerto Rico, and the U.S. Virgin Islands. Region III – Pennsylvania, Delaware, Maryland, West Virginia, Virginia, and the District of Columbia. Region IV – Kentucky, Tennessee, North Carolina, Mississippi, Alabama, Georgia, South Carolina, and Florida. Region V – Minnesota, Wisconsin, Illinois, Michigan, Indiana and Ohio. Region VI – New Mexico, Oklahoma, Arkansas, Louisiana, and Texas. Region VII – Nebraska, Kansas, Missouri, and Iowa. Region VIII – Montana, Wyoming, North Dakota, South Dakota, Utah, and Colorado. Region IX – California, Nevada, Arizona, Hawaii, Guam, American Samoa, Commonwealth of the Northern Mariana Islands. Region X – Washington, Oregon, Idaho, and Alaska.

Equivalent method means any testing or analytical method approved by the Administrator under §§ 260.20 and 260.21.

Existing hazardous waste management (HWM) facility or existing facility means a facility which was in operation or for which construction commenced on or before November 19, 1980. A facility has commenced construction if: (1) The owner or operator has obtained the Federal, State and local approvals or permits necessary to begin physical construction; and either (2)(I) A continuous on-site, physical construction program has begun; or (ii) The owner or operator has entered into contractual obligations -- which cannot be cancelled or modified without substantial loss -- for physical construction of the facility to be

completed within a reasonable time.

Existing portion means that land surface area of an existing waste management unit, included in the original Part A permit application, on which wastes have been placed prior to the issuance of a permit.

Existing tank system or existing component means a tank system or component that is used for the storage or treatment of hazardous waste and that is in operation, or for which installation has commenced on or prior to July 14, 1986. Installation will be considered to have commenced if the owner or operator has obtained all Federal, State, and local approvals or permits necessary to begin physical construction of the site or installation of the tank system and if either (1) a continuous on-site physical construction or installation program has begun, or (2) the owner or operator has entered into contractual obligations -- which cannot be canceled or modified without substantial loss -- for physical construction of the site or installation of the tank system to be completed within a reasonable time.

Explosives or munitions emergency response specialist means an individual trained in chemical or conventional munitions or explosives handling, transportation, render-safe procedures, or destruction techniques. Explosives or munitions emergency response specialists include Department of Defense (DOD) emergency explosive ordnance disposal (EOD), technical escort unit (TEU), and DOD-certified civilian or contractor personnel; and other Federal, State, or local government, or civilian personnel similarly trained in explosives or munitions emergency responses.

Explosives or munitions emergency means a situation involving the suspected or detected presence of unexploded ordnance (UXO), damaged or deteriorated explosives or munitions, an improvised explosive device (IED), other potentially explosive material or device, or other potentially harmful military chemical munitions or device, that creates an actual or potential imminent threat to human health, including safety, or the environment, including property, as determined by an explosives or munitions emergency response specialist. Such situations may require immediate and expeditious action by an explosives or munitions emergency response specialist to control, mitigate, or eliminate the threat.

Explosives or munitions emergency response means all immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency. An explosives or munitions emergency response may include in-place render-safe procedures, treatment or destruction of the explosives or munitions and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at RCRA facilities.

F

Facility means: (1) All contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combinations of them). (2) For the purpose of implementing corrective action under § 264.101, all contiguous property under the control of the owner or operator seeking a permit under subtitle C of RCRA. This definition also applies to facilities implementing corrective action under RCRA Section 3008(h). (3) Notwithstanding paragraph (2) of this definition, a remediation waste management site is not a facility that is subject to 40 CFR 264.101, but is subject to corrective action requirements if the site is located within such a facility.

Facility means all thermal processing equipment, buildings, and grounds at a specific site.

Federal agency means any department, agency, or other instrumentality of the Federal Government, any independent agency or establishment of the Federal Government including any Government corporation, and the Government Printing Office.

Federal, State, and local approvals or permits necessary to begin physical construction means permits and approvals required under Federal, State or local hazardous waste control statutes, regulations or ordinances.

Final closure means the closure of all hazardous waste management units at the facility in accordance with all applicable closure requirements so that hazardous waste management activities under parts 264 and 265 of this chapter are no longer conducted at the facility unless subject to the provisions in § 262.34.

Fly ash means suspended particles, charred paper, dust, soot, and other partially oxidized matter carried in the products of combustion.

Food-chain crops means tobacco, crops grown for human consumption, and crops grown for feed for animals whose products are consumed by humans.

Free liquids means liquids which readily separate from the solid portion of a waste under ambient temperature and pressure.

Free moisture means liquid that will drain freely by gravity from solid materials.

Freeboard means the vertical distance between the top of a tank or surface impoundment dike, and the surface of the waste contained therein.

Furnace means the chambers of the combustion train where drying, ignition, and combustion of waste material and evolved gases occur.

G

Generator means any person, by site, whose act or process produces hazardous waste identified or listed in part 261 of this chapter or whose act first causes a hazardous waste to become subject to regulation.

Grate siftings means the materials that fall from the solid waste fuel bed through the grate openings.

Gross calorific value means heat liberated when waste is burned completely and the products of combustion are cooled to the initial temperature of the waste. Usually expressed in British thermal units per pound.

Ground water means water below the land surface in a zone of saturation.

H

Hazardous waste means any waste or combination of wastes which pose a substantial present or potential hazard to human health or living organisms because such wastes are nondegradable or persistent in nature or because they can be biologically magnified, or because they can be lethal, or because they may otherwise cause or tend to cause detrimental cumulative effects.

Hazardous waste constituent means a constituent that caused the Administrator to list the hazardous waste in part 261, subpart D, of this chapter, or a constituent listed in table 1 of § 261.24 of this chapter.

Hazardous waste management unit is a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

I

Incompatible waste means a hazardous waste which is unsuitable for: (1) Placement in a particular device or facility because it may cause corrosion or decay of containment materials (e.g., container inner liners or tank walls); or (2) Commingling with another waste or material under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases, or flammable fumes or gases.

In operation refers to a facility which is treating, storing, or disposing of hazardous waste.

Inactive portion means that portion of a facility which is not operated after the effective date of part 261 of this chapter. (See also "active portion" and "closed portion".)

Incineration means the controlled process which

combustible solid, liquid, or gaseous wastes are burned and changed into noncombustible gases.

Incinerator means a facility consisting of one or more furnaces in which wastes are burned.

Incinerator means any enclosed device that: (1) Uses controlled flame combustion and neither meets the criteria for classification as a boiler, sludge dryer, or carbon regeneration unit, nor is listed as an industrial furnace; or (2) Meets the definition of infrared incinerator or plasma arc incinerator.

Incompatible waste means a hazardous waste which is unsuitable for: (1) Placement in a particular device or facility because it may cause corrosion or decay of containment materials (e.g., container inner liners or tank walls); or (2) Commingling with another waste or material under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases, or flammable fumes or gases. See part 265, appendix V of this chapter for examples.)

Individual generation site means the contiguous site at or on which one or more hazardous wastes are generated. An individual generation site, such as a large manufacturing plant, may have one or more sources of hazardous waste but is considered a single or individual generation site if the site or property is contiguous.

Industrial furnace means any of the following enclosed devices that are integral components of manufacturing processes and that use thermal treatment to accomplish recovery of materials or energy: (1) Cement kilns (2) Lime kilns (3) Aggregate kilns (4) Phosphate kilns (5) Coke ovens (6) Blast furnaces (7) Smelting, melting and refining furnaces (including pyrometallurgical devices such as cupolas, reverberator furnaces, sintering machine, roasters, and foundry furnaces) (8) Titanium dioxide chloride process oxidation reactors (9) Methane reforming furnaces (10) Pulping liquor recovery furnaces (11) Combustion devices used in the recovery of sulfur values from spent sulfuric acid (12) Halogen acid furnaces (HAFs) for the production of acid from halogenated hazardous waste generated by chemical production facilities where the furnace is located on the site of a chemical production facility, the acid product has a halogen acid content of at least 3%, the acid product is used in a manufacturing process, and, except for hazardous waste burned as fuel, hazardous waste fed to the furnace has a minimum halogen content of 20% as-generated. (13) Such other devices as the Administrator may, after notice and comment, add to this list on the basis of one or more of the following factors: (I) The design and use of the device primarily to accomplish recovery of material products; (ii) The use of the device to burn or reduce raw materials to make a material product; (iii) The use of the device to burn or reduce secondary materials as effective substitutes for raw materials, in processes using raw materials as principal feedstocks; (iv) The use of the device to burn or reduce secondary materials as ingredients in an industrial process to make a material product; (v) The use of the device in common industrial practice to produce a material product; and (vi) Other factors, as appropriate.

Infectious waste means: (1) Equipment, instruments, utensils, and fomites of a disposable nature from the rooms of patients who are suspected to have or have been diagnosed as having a communicable disease and must, therefore, be isolated as required by public health agencies; (2) laboratory wastes such as pathological specimens (e.g., all tissues, specimens of blood elements, excreta, and secretions obtained from patients or laboratory animals) and disposable fomites (any substance that may harbor or transmit pathogenic organisms) attendant thereto; (3) surgical operating room pathologic specimens and disposable fomites attendant thereto and similar disposable materials from outpatient areas and emergency rooms.

Infrared incinerator means any enclosed device that uses electric powered resistance heaters as a source of radiant heat followed by an afterburner using controlled flame combustion and which is not listed as an industrial furnace.

Inground tank means a device meeting the definition of "tank" in § 1A260.10 whereby a portion of the tank wall is situated to any degree within the ground, thereby preventing visual inspection of that external surface area of the tank that is in the ground.

Injection well means a well into which fluids are

injected. (See also "underground injection".)

Inner liner means a continuous layer of material placed inside a tank or container which protects the construction materials of the tank or container from the contained waste or reagents used to treat the waste.

Installation inspector means a person who, by reason of his knowledge of the physical sciences and the principles of engineering, acquired by a professional education and related practical experience, is qualified to supervise the installation of tank systems.

International shipment means the transportation of hazardous waste into or out of the jurisdiction of the United States.

L

Lamp, also referred to as "universal waste lamp", is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

Land treatment facility means a facility or part of a facility at which hazardous waste is applied onto or incorporated into the soil surface; such facilities are disposal facilities if the waste will remain after closure.

Landfill cell means a discrete volume of a hazardous waste landfill which uses a liner to provide isolation of wastes from adjacent cells or wastes. Examples of landfill cells are trenches and pits.

Landfill means a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

Leachate means any liquid, including any suspended components in the liquid, that has percolated through or drained from hazardous waste.

Leak-detection system means a system capable of detecting the failure of either the primary or secondary containment structure or the presence of a release of hazardous waste or accumulated liquid in the secondary containment structure. Such a system must employ operational controls (e.g., daily visual inspections for releases into the secondary containment system of aboveground tanks) or consist of an interstitial monitoring device designed to detect continuously and automatically the failure of the primary or secondary containment structure or the presence of a release of hazardous waste into the secondary containment structure.

Liner means a continuous layer of natural or man-made materials, beneath or on the sides of a surface impoundment, landfill, or landfill cell, which restricts the downward or lateral escape of hazardous waste, hazardous waste constituents, or leachate.

M

Management or hazardous waste management means the systematic control of the collection, source separation, storage, transportation, processing, treatment, recovery, and disposal of hazardous waste.

Manifest document number means the U.S. EPA twelve digit identification number assigned to the generator plus a unique five digit document number assigned to the Manifest by the generator for recording and reporting purposes.

Manifest means the shipping document EPA form 8700-22 and, if necessary, EPA form 8700-22A, originated and signed by the generator in accordance with the instructions included in the appendix to part 262.

Military munitions means all ammunition products and components produced or used by or for the U.S. Department of Defense or the U.S. Armed Services for national defense and security, including military munitions under the control of the Department of Defense, the U.S. Coast Guard, the U.S. Department of Energy (DOE), and National Guard personnel. The term military munitions includes: confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries used by DOD components, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms

ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. Military munitions do not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components thereof. However, the term does include non-nuclear components of nuclear devices, managed under DOE's nuclear weapons program after all required sanitization operations under the Atomic Energy Act of 1954, as amended, have been completed.

Mining overburden returned to the mine site means any material overlying an economic mineral deposit which is removed to gain access to that deposit and is then used for reclamation of a surface mine.

Miscellaneous unit means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under part 146 of this chapter, containment building, corrective action management unit, unit eligible for a research, development, and demonstration permit under 40 CFR 270.65, or staging pile.

Movement means that hazardous waste transported to a facility in an individual vehicle.

Municipal solid wastes means normally, residential and commercial solid wastes generated within a community.

N

New hazardous waste management facility or new facility means a facility which began operation, or for which construction commenced after October 21, 1976. (See also "Existing hazardous waste management facility".)

New tank system or new tank component means a tank system or component that will be used for the storage or treatment of hazardous waste and for which installation has commenced after July 14, 1986; except, however, for purposes of § 264.193(g)(2) and § 265.193(g)(2), a new tank system is one for which construction commences after July 14, 1986. (See also "existing tank system.")

O

On ground tank means a device meeting the definition of "tank" in § 1A260.10 and that is situated in such a way that the bottom of the tank is on the same level as the adjacent surrounding surface so that the external tank bottom cannot be visually inspected.

On-site means the same or geographically contiguous property which may be divided by public or private right-of-way, provided the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing as opposed to going along, the right-of-way. Non-contiguous properties owned by the same person but connected by a right-of-way which he controls and to which the public does not have access, is also considered on-site property.

Open burning means the combustion of any material without the following characteristics: (1) Control of combustion air to maintain adequate temperature for efficient combustion, (2) Containment of the combustion-reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and (3) Control of emission of the gaseous combustion products. (See also "incineration" and "thermal treatment".)

Open burning means burning of solid wastes in the open, such as in an open dump.

Open burning means the combustion of any material without the following characteristics: (1) Control of combustion air to maintain adequate temperature for efficient combustion, (2) Containment of the combustion-reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and (3) Control of emission of the gaseous combustion products. (See also "incineration" and "thermal treatment".)

Open dump means a land disposal site at which solid wastes are disposed of in a manner that does not protect the environment, are susceptible to open burning, and are exposed to the elements, vectors, and scavengers.

Operator means the person responsible for the overall operation of a facility.

Overfire air means air, under control as to quantity and direction, introduced above or beyond a fuel

bed by induced or forced draft.

Owner means the person who owns a facility or part of a facility.

P

Partial closure means the closure of a hazardous waste management unit in accordance with the applicable closure requirements of parts 264 and 265 of this chapter at a facility that contains other active hazardous waste management units. For example, partial closure may include the closure of a tank (including its associated piping and underlying containment systems), landfill cell, surface impoundment, waste pile, or other hazardous waste management unit, while other units of the same facility continue to operate.

Person means an individual, trust, firm, joint stock company, Federal Agency, corporation (including a government corporation), partnership, association, State, municipality, commission, political subdivision of a State, or any interstate body.

Personnel or facility personnel means all persons who work, at, or oversee the operations of, a hazardous waste facility, and whose actions or failure to act may result in noncompliance with the requirements of part 264 or 265 of this chapter.

Pesticide means any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant, other than any article that: (1) Is a new animal drug under FFDCA section 201(w), or (2) Is an animal drug that has been determined by regulation of the Secretary of Health and Human Services not to be a new animal drug, or (3) Is an animal feed under FFDCA section 201(x) that bears or contains any substances described by paragraph (1) or (2) of this definition.

Pile means any non-containerized accumulation of solid, nonflowing hazardous waste that is used for treatment or storage and that is not a containment building.

Plans means reports and drawings, including a narrative operating description, prepared to describe the facility and its proposed operation.

Plasma arc incinerator means any enclosed device using a high intensity electrical discharge or arc as a source of heat followed by an afterburner using controlled flame combustion and which is not listed as an industrial furnace.

Point source means any discernible, confined, and discrete conveyance, including, but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.

Publicly owned treatment works or POTW means any device or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality" (as defined by section 502(4) of the CWA). This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Q

Qualified Ground-Water Scientist means a scientist or engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering, and has sufficient training and experience in ground-water hydrology and related fields as may be demonstrated by state registration, professional certifications, or completion of accredited university courses that enable that individual to make sound professional judgements regarding ground-water monitoring and contaminant fate and transport.

R

Regional Administrator means the Regional Administrator for the EPA Region in which the facility is located, or his designee.

Remediation waste management site means a facility where an owner or operator is or will be treating, storing or disposing of hazardous remediation wastes. A remediation waste management site is not a facility that is subject to corrective action under 40 CFR 264.101, but is subject to corrective action requirements if the site is located in such a facility.

Remediation waste means all solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris,

that are managed for implementing cleanup.

Replacement unit means a landfill, surface impoundment, or waste pile unit (1) from which all or substantially all of the waste is removed, and (2) that is subsequently reused to treat, store, or dispose of hazardous waste. "Replacement unit" does not apply to a unit from which waste is removed during closure, if the subsequent reuse solely involves the disposal of waste from that unit and other closing units or corrective action areas at the facility, in accordance with an approved closure plan or EPA or State approved corrective action.

Representative sample means a sample of a universe or whole (e.g., waste pile, lagoon, ground water) which can be expected to exhibit the average properties of the universe or whole.

Residue means all the solids that remain after completion of thermal processing, including bottom ash, fly ash, and grate siftings.

Responsible agency means the organizational element that has the legal duty to ensure that owners, operators, or users of facilities comply with these guidelines.

Run-off means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

Run-on means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

S

Sanitary landfill means a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading the solid wastes in thin layers, compacting the solid wastes to the smallest practical volume, and applying and compacting cover material at the end of each operating day.

Saturated zone or zone of saturation means that part of the earth's crust in which all voids are filled with water.

Sludge dryer means any enclosed thermal treatment device that is used to dehydrate sludge and that has a maximum total thermal input, excluding the heating value of the sludge itself, of 2,500 Btu/lb of sludge treated on a wet-weight basis.

Sludge means any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

Sludge means the accumulated semiliquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants.

Small Quantity Generator means a generator who generates less than 1000 kg of hazardous waste in a calendar month.

Solid waste means a solid waste as defined in § 261.2 of this chapter.

Solid wastes means garbage, refuse, sludges, and other discarded solid materials resulting from industrial and commercial operations and from community activities. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants.

Sorbent means a material that is used to soak up free liquids by either adsorption or absorption, or both. Sorb means to either adsorb or absorb, or both.

Special wastes means nonhazardous solid wastes requiring handling other than that normally used for municipal solid waste.

Staging pile means an accumulation of solid, non-flowing remediation waste (as defined in this section) that is not a containment building and that is used only during remedial operations for temporary storage at a facility. Staging piles must be designated by the Director according to the requirements of 40 CFR 264.554.

State means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American

Samoa, and the Commonwealth of the Northern Mariana Islands.

Storage means the holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere.

Sump means any pit or reservoir that meets the definition of tank and those troughs/trenches connected to it that serve to collect hazardous waste for transport to hazardous waste storage, treatment, or disposal facilities; except that as used in the landfill, surface impoundment, and waste pile rules, "sump" means any lined pit or reservoir that serves to collect liquids drained from a leachate collection and removal system or leak detection system for subsequent removal from the system.

Surface impoundment or impoundment means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, and lagoons.

T

Tank means a stationary device, designed to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support.

Tank system means a hazardous waste storage or treatment tank and its associated ancillary equipment and containment system.

TEQ means toxicity equivalence, the international method of relating the toxicity of various dioxin/furan congeners to the toxicity of 2,3,7,8-tetrachlorodibenzo-p-dioxin.

Thermal processing means processing of waste material by means of heat.

Thermal treatment means the treatment of hazardous waste in a device which uses elevated temperatures as the primary means to change the chemical, physical, or biological character or composition of the hazardous waste. Examples of thermal treatment processes are incineration, molten salt, pyrolysis, calcination, wet air oxidation, and microwave discharge. (See also "incinerator" and "open burning".)

Thermostat means a temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of 40 CFR 273.13©)(2) or 273.33©)(2).

Totally enclosed treatment facility means a facility for the treatment of hazardous waste which is directly connected to an industrial production process and which is constructed and operated in a manner which prevents the release of any hazardous waste or any constituent thereof into the environment during treatment. An example is a pipe in which waste acid is neutralized.

Transfer facility means any transportation related facility including loading docks, parking areas, storage areas and other similar areas where shipments of hazardous waste are held during the normal course of transportation.

Transport vehicle means a motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (trailer, railroad freight car, etc.) is a separate transport vehicle.

Transportation means the movement of hazardous waste by air, rail, highway, or water.

Transporter means a person engaged in the offsite transportation of hazardous waste by air, rail, highway, or water.

Treatability Study means a study in which a hazardous waste is subjected to a treatment process to determine: (1) Whether the waste is amenable to the treatment process, (2) what pretreatment (if any) is required, (3) the optimal process conditions needed to achieve the desired treatment, (4) the efficiency of a treatment process for a specific waste or wastes, or (5) the characteristics and volumes of residuals from a particular treatment process. Also included in this definition for the purpose of the § 261.4 (e) and (f) exemptions are liner compatibility, corrosion, and other material compatibility studies and toxicological and health

effects studies. A "treatability study" is not a means to commercially treat or dispose of hazardous waste.

Treatment means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

Treatment zone means a soil area of the unsaturated zone of a land treatment unit within which hazardous constituents are degraded, transformed, or immobilized.

U

Underfire air means any forced or induced air, under control as to quantity and direction, that is supplied from beneath and which passes through the solid wastes fuel bed.

Underground injection means the subsurface emplacement of fluids through a bored, drilled or driven well; or through a dug well, where the depth of the dug well is greater than the largest surface dimension. (See also "injection well".)

Underground tank means a device meeting the definition of "tank" in § 260.10 whose entire surface area is totally below the surface of and covered by the ground.

Unfit-for use tank system means a tank system that has been determined through an integrity assessment or other inspection to be no longer capable of storing or treating hazardous waste without posing a threat of release of hazardous waste to the environment.

United States means the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

Universal Waste Handler: (1) Means: (I) A generator (as defined in this section) of universal waste; or (ii) The owner or operator of a facility, including all contiguous property, that receives universal waste from other universal waste handlers, accumulates universal waste, and sends universal waste to another universal waste handler, to a destination facility, or to a foreign destination. (2) Does not mean: (I) A person who treats (except under the provisions of 40 CFR 273.13 (a) or ©), or 273.33 (a) or ©)), disposes of, or recycles universal waste; or (ii) A person engaged in the off-site transportation of universal waste by air, rail, highway, or water, including a universal waste transfer facility.

Universal Waste means any of the following hazardous wastes that are managed under the universal waste requirements of part § 273 of this chapter: (1) Batteries as described in § 273.2 of this chapter; (2) Pesticides as described in § 273.3 of this chapter; (3) Thermostats as described in § 273.4 of this chapter; and (4) Lamps as described in § 273.5 of this chapter.

Universal Waste Transporter means a person engaged in the off-site transportation of universal waste by air, rail, highway, or water.

Unsaturated zone or zone of aeration means the zone between the land surface and the water table.

Uppermost aquifer means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

Used oil means any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use in contaminated by physical or chemical impurities.

V

Vector means a carrier, usually an arthropod, that is capable of transmitting a pathogen from one organism to another. means a hazardous waste treatment, storage, or disposal facility which (1) has received a permit (or interim status) in accordance with the requirements of parts 270 and 124 of this chapter, (2) has received a permit (or interim status) from a State authorized in accordance with part 271 of this chapter, or (3) is regulated under § 261.6©)(2) or subpart F of part 266 of this chapter, and (4) that has been designated on the manifest by the generator pursuant to § 260.20. If a waste is destined to a facility in an authorized State

which has not yet obtained authorization to regulate that particular waste as hazardous, then the designated facility must be a facility allowed by the receiving State to accept such waste.

Vessel includes every description of watercraft, used or capable of being used as a means of transportation on the water.

W

Wastewater treatment unit means a device which: (1) Is part of a wastewater treatment facility that is subject to regulation under either section 402 or 307(b) of the Clean Water Act; and (2) Receives and treats or stores an influent wastewater that is a hazardous waste as defined in § 261.3 of this chapter, or that generates and accumulates a wastewater treatment sludge that is a hazardous waste as defined in § 261.3 of this chapter, or treats or stores a wastewater treatment sludge which is a hazardous waste as defined in § 261.3 of this Chapter; and (3) Meets the definition of tank or tank system in § 260.10 of this chapter.

Water (bulk shipment) means the bulk transportation of hazardous waste which is loaded or carried on board a vessel without containers or labels.

Well injection: (See "underground injection".)

Well means any shaft or pit dug or bored into the earth, generally of a cylindrical form, and often walled with bricks or tubing to prevent the earth from caving in.

Z

Zone of engineering control means an area under the control of the owner/operator that, upon detection of a hazardous waste release, can be readily cleaned up prior to the release of hazardous waste or hazardous constituents to ground water or surface water.

FEDERAL DEFINITION OF HAZARDOUS WASTE

(This definition refers to a table that is not included here)

40 CFR 261.3
§ 261.3 Definition of hazardous waste.

(a) A solid waste, as defined in § 261.2, is a hazardous waste if:

(1) It is not excluded from regulation as a hazardous waste under § 261.4(b); and

(2) It meets any of the following criteria:

(i) It exhibits any of the characteristics of hazardous waste identified in subpart C of this part. However, any mixture of a waste from the extraction, beneficiation, and processing of ores and minerals excluded under § 261.4(b)(7) and any other solid waste exhibiting a characteristic of hazardous waste under subpart C is a hazardous waste only if it exhibits a characteristic that would not have been exhibited by the excluded waste alone if such mixture had not occurred, or if it continues to exhibit any of the characteristics exhibited by the non-excluded wastes prior to mixture. Further, for the purposes of applying the Toxicity Characteristic to such mixtures, the mixture is also a hazardous waste if it exceeds the maximum concentration for any contaminant listed in table I to § 261.24 that would not have been exceeded by the excluded waste alone if the mixture had not occurred or if it continues to exceed the maximum concentration for any contaminant exceeded by the nonexempt waste prior to mixture.

(ii) It is listed in subpart D of this part and has not been excluded from the lists in subpart D of this part under §§ 260.20 and 260.22 of this chapter.

(iii) [Reserved]

(iv) It is a mixture of solid waste and one or more hazardous wastes listed in subpart D of this part and has not been excluded from paragraph (a)(2) of this section under §§ 260.20 and 260.22, paragraph (g) of this section, or paragraph (h) of this section; however, the following mixtures of solid wastes and hazardous wastes listed in subpart D of this part are not hazardous wastes (except by application of paragraph (a)(2)(i) or (ii) of this section) if the generator can demonstrate that the mixture consists of wastewater the discharge of which is subject to regulation under either section 402 or section 307(b) of the Clean Water Act (including wastewater at facilities which have eliminated the discharge of wastewater) and;

(A) One or more of the following solvents listed in § 261.31 -- carbon tetrachloride, tetrachloroethylene, trichloroethylene -- Provided, That the maximum total weekly usage of these solvents (other than the amounts that can be demonstrated not to be discharged to wastewater) divided by the average weekly flow of wastewater into the headworks of the facility's wastewater treatment or pretreatment system does not exceed 1 part per million; or

(B) One or more of the following spent solvents listed in § 261.31 -- methylene chloride, 1,1,1-trichloroethane, chlorobenzene, o-dichlorobenzene, cresols, cresylic acid, nitrobenzene, toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, spent chlorofluorocarbon solvents -- provided that the maximum total weekly usage of these solvents (other than the amounts that can be demonstrated not to be discharged to wastewater) divided by the average weekly flow of wastewater into the headworks of the facility's wastewater treatment or pretreatment system does not exceed 25 parts per million; or

(C) One of the following wastes listed in § 261.32, provided that the wastes are discharged to the refinery oil recovery sewer before primary oil/water/solids separation -- heat exchanger bundle cleaning sludge from the petroleum refining industry (EPA Hazardous Waste No. K050), crude oil storage tank sediment from

petroleum refining operations (EPA Hazardous Waste No. K169), clarified slurry oil tank sediment and/or in-line filter/separation solids from petroleum refining operations (EPA Hazardous Waste No. K170), spent hydrotreating catalyst(EPA Hazardous Waste No. K171), and spent hydrorefining catalyst (EPA Hazardous Waste No. K172); or

(D) A discarded commercial chemical product, or chemical intermediate listed in § 261.33, arising from de minimis losses of these materials from manufacturing operations in which these materials are used as raw materials or are produced in the manufacturing process. For purposes of this paragraph (a)(2)(iv)(D), "de minimis" losses include those from normal material handling operations (e.g., spills from the unloading or transfer of materials from bins or other containers, leaks from pipes, valves or other devices used to transfer materials); minor leaks of process equipment, storage tanks or containers; leaks from well maintained pump packings and seals; sample purgings; relief device discharges; discharges from safety showers and rinsing and cleaning of personal safety equipment; and rinsate from empty containers or from containers that are rendered empty by that rinsing; or

(E) Wastewater resulting from laboratory operations containing toxic (T) wastes listed in subpart D of this part, Provided, That the annualized average flow of laboratory wastewater does not exceed one percent of total wastewater flow into the headworks of the facility's wastewater treatment or pre-treatment system or provided the wastes, combined annualized average concentration does not exceed one part per million in the headworks of the facility's wastewater treatment or pre-treatment facility. Toxic (T) wastes used in laboratories that are demonstrated not to be discharged to wastewater are not to be included in this calculation; or

(F) One or more of the following wastes listed in § 261.32 -- wastewaters from the production of carbamates and carbamoyl oximes (EPA Hazardous Waste No. K157) -- Provided that the maximum weekly usage of formaldehyde, methyl chloride, methylene chloride, and triethylamine (including all amounts that can not be demonstrated to be reacted in the process, destroyed through treatment, or is recovered, i.e., what is discharged or volatilized) divided by the average weekly flow of process wastewater prior to any dilutions into the headworks of the facility's wastewater treatment system does not exceed a total of 5 parts per million by weight; or

(G) Wastewaters derived from the treatment of one or more of the following wastes listed in § 261.32 -- organic waste (including heavy ends, still bottoms, light ends, spent solvents, filtrates, and decantates) from the production of carbamates and carbamoyl oximes (EPA Hazardous Waste No. K156). -- Provided, that the maximum concentration of formaldehyde, methyl chloride, methylene chloride, and triethylamine prior to any dilutions into the headworks of the facility's wastewater treatment system does not exceed a total of 5 milligrams per liter.

(v) Rebuttable presumption for used oil. Used oil containing more than 1000 ppm total halogens is presumed to be a hazardous waste because it has been mixed with halogenated hazardous waste listed in subpart D of part 261 of this chapter. Persons may rebut this presumption by demonstrating that the used oil does not contain hazardous waste (for example, by using an analytical method from SW-846, Third Edition, to show that the used oil does not contain significant concentrations of halogenated hazardous constituents listed in appendix VIII of part 261 of this chapter). EPA Publication SW-846, Third Edition, is available for the cost of $ 110.00 from the Government Printing Office, Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7954. 202-783-3238 (document number 955-001-00000-1).

(A) The rebuttable presumption does not apply to metalworking oils/fluids containing chlorinated paraffins, if they are processed, through a tolling agreement, to reclaim metalworking oils/fluids. The presumption does apply to metalworking oils/fluids if such oils/fluids are recycled in any other manner, or disposed.

(B) The rebuttable presumption does not apply to used oils contaminated with chlorofluorocarbons (CFCs) removed from refrigeration units where the CFCs are destined for reclamation. The rebuttable presumption does apply to used oils contaminated with CFCs that have been mixed with used oil from sources other than refrigeration units.

(b) A solid waste which is not excluded from regulation under paragraph (a)(1) of this section becomes a hazardous waste when any of the following events occur:

(1) In the case of a waste listed in subpart D of this part, when the waste first meets the listing description set forth in subpart D of this part.

(2) In the case of a mixture of solid waste and one or more listed hazardous wastes, when a hazardous waste listed in subpart D is first added to the solid waste.

(3) In the case of any other waste (including a waste mixture), when the waste exhibits any of the characteristics identified in subpart C of this part.

(c) Unless and until it meets the criteria of paragraph (d) of this section:

(1) A hazardous waste will remain a hazardous waste.

(2)(i) Except as otherwise provided in paragraph (c)(2)(ii), (g) or (h) of this section, any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue, ash emission control dust, or leachate (but not including precipitation run-off) is a hazardous waste. (However, materials that are reclaimed from solid wastes and that are used beneficially are not solid wastes and hence are not hazardous wastes under this provision unless the reclaimed material is burned for energy recovery or used in a manner constituting disposal.)

(ii) The following solid wastes are not hazardous even though they are generated from the treatment, storage, or disposal of a hazardous waste, unless they exhibit one or more of the characteristics of hazardous waste:

(A) Waste pickle liquor sludge generated by lime stabilization of spent pickle liquor from the iron and steel industry (SIC Codes 331 and 332).

(B) Waste from burning any of the materials exempted from regulation by § 261.6(a)(3)(iii) and (iv).

(C)(1) Nonwastewater residues, such as slag, resulting from high temperature metals recovery (HTMR) processing of K061, K062 or F006 waste, in units identified as rotary kilns, flame reactors, electric furnaces, plasma arc furnaces, slag reactors, rotary hearth furnace/electric furnace combinations or industrial furnaces (as defined in paragraphs (6), (7), and (13) of the definition for "Industrial furnace" in 40 CFR 260.10), that are disposed in subtitle D units, provided that these residues meet the generic exclusion levels identified in the tables in this paragraph for all constituents, and exhibit no characteristics of hazardous waste. Testing requirements must be incorporated in a facility's waste analysis plan or a generator's self-implementing waste analysis plan; at a minimum, composite samples of residues must be collected and analyzed quarterly and/or when the process or operation generating the waste changes. Persons claiming this exclusion in an enforcement action will have the burden of proving by clear and convincing evidence that the material meets all of the exclusion requirements.

(2) A one-time notification and certification must be placed in the facility's files and sent to the EPA region or authorized state for K061, K062 or F006 HTMR residues that meet the generic exclusion levels for all constituents and do not exhibit any characteristics that are sent to subtitle D units. The notification and certification that is placed in the generators or treaters files must be updated if the process or operation generating the waste changes and/or if the subtitle D unit receiving the waste changes. However, the generator or treater need only notify the EPA region or an authorized state on an annual basis if such changes occur. Such notification and certification should be sent to the EPA region or authorized state by the end of the calendar year, but no later than December 31. The notification must include the following information: The name and address of the subtitle D unit receiving the waste shipments; the EPA Hazardous Waste Number(s) and treatability group(s) at the initial point of generation; and, the treatment standards applicable to the waste at the initial point of generation. The certification must be signed by an authorized representative and must state as follows: "I certify under penalty of law that the generic exclusion levels for

all constituents have been met without impermissible dilution and that no characteristic of hazardous waste is exhibited. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

(D) Biological treatment sludge from the treatment of one of the following wastes listed in § 261.32-organic waste (including heavy ends, still bottoms, light ends, spent solvents, filtrates, and decantates) from the production of carbamates and carbamoyl oximes (EPA Hazardous Waste No. K156), and wastewaters from the production of carbamates and carbamoyl oximes (EPA Hazardous Waste No. K157).
(E) Catalyst inert support media separated from one of the following wastes listed in § 261.32 -- Spent hydrotreating catalyst (EPA Hazardous Waste No. K171), and Spent hydrorefining catalyst (EPA Hazardous Waste No. K172).

(d) Any solid waste described in paragraph (c) of this section is not a hazardous waste if it meets the following criteria:

(1) In the case of any solid waste, it does not exhibit any of the characteristics of hazardous waste identified in subpart C of this part. (However, wastes that exhibit a characteristic at the point of generation may still be subject to the requirements of part 268, even if they no longer exhibit a characteristic at the point of land disposal.)

(2) In the case of a waste which is a listed waste under subpart D of this part, contains a waste listed under subpart D of this part or is derived from a waste listed in subpart D of this part, it also has been excluded from paragraph (c) of this section under §§ 260.20 and 260.22 of this chapter.

(e) [Reserved]

(f) Notwithstanding paragraphs (a) through (d) of this section and provided the debris as defined in part 268 of this chapter does not exhibit a characteristic identified at subpart C of this part, the following materials are not subject to regulation under 40 CFR parts 260, 261 to 266, 268, or 270:

(1) Hazardous debris as defined in part 268 of this chapter that has been treated using one of the required extraction or destruction technologies specified in Table 1 of § 268.45 of this chapter; persons claiming this exclusion in an enforcement action will have the burden of proving by clear and convincing evidence that the material meets all of the exclusion requirements; or

(2) Debris as defined in part 268 of this chapter that the Regional Administrator, considering the extent of contamination, has determined is no longer contaminated with hazardous waste.

(g)(1) A hazardous waste that is listed in subpart D of this part solely because it exhibits one or more characteristics of ignitability as defined under § 261.21, corrosivity as defined under § 261.22, or reactivity as defined under § 261.23 is not a hazardous waste, if the waste no longer exhibits any characteristic of hazardous waste identified in subpart C of this part.

(2) The exclusion described in paragraph (g)(1) of this section also pertains to:

(i) Any mixture of a solid waste and a hazardous waste listed in subpart D of this part solely because it exhibits the characteristics of ignitability, corrosivity, or reactivity as regulated under paragraph (a)(2)(iv) of this section; and

(ii) Any solid waste generated from treating, storing, or disposing of a hazardous waste listed in subpart D of this part solely because it exhibits the characteristics of ignitability, corrosivity, or reactivity as regulated under paragraph (c)(2)(i) of this section.

(3) Wastes excluded under this section are subject to part 268 of this chapter (as applicable), even if they no longer exhibit a characteristic at the point of land disposal.

(4) any mixture of a solid waste excluded from regulation under § 261.4(b)(7) and a hazardous waste listed in subpart D of this part solely because it exhibits one or more of the characteristics of ignitability, corrosivity, or reactivity as regulated under paragraph (a)(2)(iv) of this section is not a hazardous waste, if the mixture no longer exhibits any characteristic of hazardous waste identified in subpart C of this part for which the hazardous waste listed in subpart D of this part was listed.

(h)(1) Hazardous waste containing radioactive waste is no longer a hazardous waste when it meets the eligibility criteria and conditions of 40 CFR part 266, Subpart N ("eligible radioactive mixed waste").

(2) The exemption described in paragraph (h)(1) of this section also pertains to:

(i) Any mixture of a solid waste and an eligible radioactive mixed waste; and

(ii) Any solid waste generated from treating, storing, or disposing of an eligible radioactive mixed waste.

(3) Waste exempted under this section must meet the eligibility criteria and specified conditions in 40 CFR 266.225 and 40 CFR 266.230 (for storage and treatment) and in 40 CFR 266.310 and 40 CFR 266.315 (for transportation and disposal). Waste that fails to satisfy these eligibility criteria and conditions is regulated as hazardous waste.

UTAH CODE ANNOTATED
Solid and Hazardous Waste Definitions

(3) (a) "Commercial nonhazardous solid waste treatment, storage, or disposal facility" means a facility that receives, for profit, nonhazardous solid waste for treatment, storage, or disposal.

(b) "Commercial nonhazardous solid waste treatment, storage, or disposal facility" does not include a facility that:

(i) receives waste for recycling;

(ii) receives waste to be used as fuel, in compliance with federal and state requirements; or

(iii) is solely under contract with a local government within the state to dispose of nonhazardous solid waste generated within the boundaries of the local government.

(4) "Construction waste or demolition waste":

(a) means waste from building materials, packaging, and rubble resulting from construction, demolition, remodeling, and repair of pavements, houses, commercial buildings, and other structures, and from road building and land clearing; and

(b) does not include: asbestos; contaminated soils or tanks resulting from remediation or cleanup at any release or spill; waste paints; solvents; sealers; adhesives; or similar hazardous or potentially hazardous materials.

(5) "Demolition waste" has the same meaning as the definition of construction waste in this section.

(9) "Hazardous waste" means a solid waste or combination of solid wastes other than household waste which, because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

(11) "Household waste" means any waste material, including garbage, trash, and sanitary wastes in septic tanks, derived from households, including single-family and multiple-family residences, hotels and motels, bunk houses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas.

(12) "Infectious waste" means a solid waste that contains or may reasonably be expected to contain pathogens of sufficient virulence and quantity that exposure to the waste by a susceptible host could result in an infectious disease.

(14) "Mixed waste" means any material that is a hazardous waste as defined in this chapter and is also radioactive as defined in Section 19-3-102.

(17) (a) "Solid waste" means any garbage, refuse, sludge, including sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, or other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, or agricultural operations and from community activities but does not include solid or dissolved materials in domestic sewage or in irrigation return flows or discharges for which a permit is required under Title 19, Chapter 5, Water Quality Act, or under the Water Pollution Control Act, 33 U.S.C., Section 1251, et seq.

(b) "Solid waste" does not include any of the following wastes unless the waste causes a public nuisance or public health hazard or is otherwise determined to be a hazardous waste:

(i) certain large volume wastes, such as inert construction debris used as fill material;

(ii) drilling muds, produced waters, and other wastes associated with the exploration, development, or production of oil, gas, or geothermal energy;

(iii) fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels;

(iv) solid wastes from the extraction, beneficiation, and processing of ores and minerals; or

(v) cement kiln dust.

(4) "Hazardous waste treatment, disposal, and storage facility" means a facility or site used or intended to be used for the treatment, storage, or disposal of hazardous waste materials, including but not limited to physical, chemical, or thermal processing systems, incinerators, and secure landfills.

(7) "Solid waste" means all putrescible and nonputrescible materials or substances discarded or rejected as being spent, useless, worthless, or in excess to the owner's needs at the time of discard or rejection, including garbage, refuse, industrial and commercial waste, sludges from air or water control facilities, rubbish, ashes, contained gaseous material, incinerator residue, demolition, and construction debris, discarded automobiles and offal, but not including sewage and other highly diluted water carried materials or substances and those in gaseous form.

FEDERAL DEFINITION OF SOLID WASTE

(This definition refers to a table that is not included here)

40 CFR 261.2
§ 261.2 Definition of solid waste.

(a)(1) A solid waste is any discarded material that is not excluded by § 261.4(a) or that is not excluded by variance granted under §§ 260.30 and 260.31.

(2) A discarded material is any material which is:

(i) Abandoned, as explained in paragraph (b) of this section; or
(ii) Recycled, as explained in paragraph (c) of this section; or

(iii) Considered inherently waste-like, as explained in paragraph (d) of this section; or

(iv) A military munition identified as a solid waste in 40 CFR 266.202.

(b) Materials are solid waste if they are abandoned by being:

(1) Disposed of; or

(2) Burned or incinerated; or

(3) Accumulated, stored, or treated (but not recycled) before or in lieu of being abandoned by being disposed of, burned, or incinerated.

(c) Materials are solid wastes if they are recycled -- or accumulated, stored, or treated before recycling -- as specified in paragraphs (c)(1) through (4) of this section.

(1) Used in a manner constituting disposal. (i) Materials noted with a "*" in Column 1 of Table I are solid wastes when they are:

(A) Applied to or placed on the land in a manner that constitutes disposal; or

(B) Used to produce products that are applied to or placed on the land or are otherwise contained in products that are applied to or placed on the land (in which cases the product itself remains a solid waste).

(ii) However, commercial chemical products listed in § 261.33 are not solid wastes if they are applied to the land and that is their ordinary manner of use.

(2) Burning for energy recovery. (i) Materials noted with a "*" in column 2 of Table 1 are solid wastes when they are:

(A) Burned to recover energy;

(B) Used to produce a fuel or are otherwise contained in fuels (in which cases the fuel itself remains a solid waste).

(ii) However, commercial chemical products listed in § 261.33 are not solid wastes if they are themselves fuels.

(3) Reclaimed. Materials noted with a "*" in column 3 of Table 1 are solid wastes when reclaimed (except as provided under § 261.4(a)(17)). Materials noted with a "-"in column 3 of Table 1 are not solid wastes when reclaimed.
(4) Accumulated speculatively. Materials noted with a "*" in column 4 of Table 1 are solid wastes when accumulated speculatively.

Note: The terms "spent materials,""sludges,""by-products,"and "scrap metal" and "processed scrap metal" are defined in § 261.1.

(d) Inherently waste-like materials. The following materials are solid wastes when they are recycled in any manner:

(1) Hazardous Waste Nos. F020, F021 (unless used as an ingredient to make a product at the site of generation), F022, F023, F026, and F028.

(2) Secondary materials fed to a halogen acid furnace that exhibit a characteristic of a hazardous waste or are listed as a hazardous waste as defined in subparts C or D of this part, except for brominated material that meets the following criteria:

(i) The material must contain a bromine concentration of at least 45%; and

(ii) The material must contain less than a total of 1% of toxic organic compounds listed in appendix VIII; and

(iii) The material is processed continually on-site in the halogen acid furnace via direct conveyance (hard piping).

(3) The Administrator will use the following criteria to add wastes to that list:

(i)(A) The materials are ordinarily disposed of, burned, or incinerated; or

(B) The materials contain toxic constituents listed in appendix VIII of part 261 and these constituents are not ordinarily found in raw materials or products for which the materials substitute (or are found in raw materials or products in smaller concentrations) and are not used or reused during the recycling process; and

(ii) The material may pose a substantial hazard to human health and the environment when recycled.

(e) Materials that are not solid waste when recycled. (1) Materials are not solid wastes when they can be shown to be recycled by being:

(i) Used or reused as ingredients in an industrial process to make a product, provided the materials are not being reclaimed; or

(ii) Used or reused as effective substitutes for commercial products; or

(iii) Returned to the original process from which they are generated, without first being reclaimed or land disposed. The material must be returned as a substitute for feedstock materials. In cases where the original process to which the material is returned is a secondary process, the materials must be managed such that there is no placement on the land. In cases where the materials are generated and reclaimed within the primary mineral processing industry, the conditions of the exclusion found at § 261.4(a)(17) apply rather than this paragraph.

(2) The following materials are solid wastes, even if the recycling involves use, reuse, or return to the original process (described in paragraphs (e)(1) (i) through (iii) of this section):

(i) Materials used in a manner constituting disposal, or used to produce products that are applied to the land; or

(ii) Materials burned for energy recovery, used to produce a fuel, or contained in fuels; or

(iii) Materials accumulated speculatively; or

(iv) Materials listed in paragraphs (d)(1) and (d)(2) of this section.

(f) Documentation of claims that materials are not solid wastes or are conditionally exempt from regulation. Respondents in actions to enforce regulations implementing subtitle C of RCRA who raise a claim that a certain material is not a solid waste, or is conditionally exempt from regulation, must demonstrate that there is a known market or disposition for the material, and that they meet the terms of the exclusion or exemption. In doing so, they must provide appropriate documentation (such as contracts showing that a second person uses the material as an ingredient in a production process) to demonstrate that the material is not a waste, or is exempt from regulation. In addition, owners or operators of facilities claiming that they actually are recycling materials must show that they have the necessary equipment to do so.

UTAH CODE ANNOTATED
Solid and Hazardous Waste Definitions

(3) (a) "Commercial nonhazardous solid waste treatment, storage, or disposal facility" means a facility that receives, for profit, nonhazardous solid waste for treatment, storage, or disposal.

(b) "Commercial nonhazardous solid waste treatment, storage, or disposal facility" does not include a facility that:

(i) receives waste for recycling;

(ii) receives waste to be used as fuel, in compliance with federal and state requirements; or

(iii) is solely under contract with a local government within the state to dispose of nonhazardous solid waste generated within the boundaries of the local government.

(4) "Construction waste or demolition waste":

(a) means waste from building materials, packaging, and rubble resulting from construction, demolition, remodeling, and repair of pavements, houses, commercial buildings, and other structures, and from road building and land clearing; and

(b) does not include: asbestos; contaminated soils or tanks resulting from remediation or cleanup at any release or spill; waste paints; solvents; sealers; adhesives; or similar hazardous or potentially hazardous materials.

(5) "Demolition waste" has the same meaning as the definition of construction waste in this section.

(9) "Hazardous waste" means a solid waste or combination of solid wastes other than household waste which, because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

(11) "Household waste" means any waste material, including garbage, trash, and sanitary wastes in septic tanks, derived from households, including single-family and multiple-family residences, hotels and motels, bunk houses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas.

(12) "Infectious waste" means a solid waste that contains or may reasonably be expected to contain pathogens of sufficient virulence and quantity that exposure to the waste by a susceptible host could result in an infectious disease.

(14) "Mixed waste" means any material that is a hazardous waste as defined in this chapter and is also radioactive as defined in Section 19-3-102.

(17) (a) "Solid waste" means any garbage, refuse, sludge, including sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, or other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, or agricultural operations and from community activities but does not include solid or dissolved materials in domestic sewage or in irrigation return flows or discharges for which a permit is required under Title 19, Chapter 5, Water Quality Act, or under the Water Pollution Control Act, 33 U.S.C., Section 1251, et seq.

(b) "Solid waste" does not include any of the following wastes unless the waste causes a public nuisance or public health hazard or is otherwise determined to be a hazardous waste:

(i) certain large volume wastes, such as inert construction debris used as fill material;

(ii) drilling muds, produced waters, and other wastes associated with the exploration, development, or production of oil, gas, or geothermal energy;

(iii) fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels;

(iv) solid wastes from the extraction, beneficiation, and processing of ores and minerals; or

(v) cement kiln dust.

(4) "Hazardous waste treatment, disposal, and storage facility" means a facility or site used or intended to be used for the treatment, storage, or disposal of hazardous waste materials, including but not limited to physical, chemical, or thermal processing systems, incinerators, and secure landfills.

(7) "Solid waste" means all putrescible and nonputrescible materials or substances discarded or rejected as being spent, useless, worthless, or in excess to the owner's needs at the time of discard or rejection, including garbage, refuse, industrial and commercial waste, sludges from air or water control facilities, rubbish, ashes, contained gaseous material, incinerator residue, demolition, and construction debris, discarded automobiles and offal, but not including sewage and other highly diluted water carried materials or substances and those in gaseous form.